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TENNESSEE STATE DEPT OF CONSERVATION NASHVILLE DIV 0--ETC F/6 13/13  
NATIONAL PROGRAM OF INSPECTION OF NON-FEDERAL DAMS, TENNESSEE. --ETC(U)  
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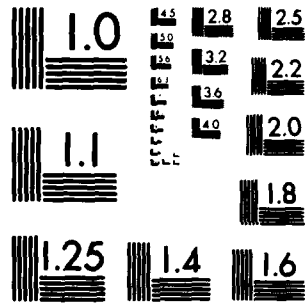
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. <b>AD-A108236</b>	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) National Program of Inspection of Non-Federal Dams Tennessee, Gladly Hollow Dam (OFDBA Site 41-1) near Lassiter Corner, Tennessee, Obion County, TN, Obion River Basin		5. TYPE OF REPORT & PERIOD COVERED Phase 1 Investigation Report
7. AUTHOR(s)		6. PERFORMING ORG. REPORT NUMBER
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Dams Dam Safety National Dam Safety Program Gladly Hollow Dam (OFDBA Site 41-1), TN Lassiter Corner, TN		Obion County, TN Embankments Visual Inspection Structural Analysis
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Report is based on the findings of a Phase I investigation of OFDBA Site 41-1 (Gladly Hollow) Dam on February 4 1981 (This study was) done in accordance with "Recommended Guidelines for Safety Inspection of Dams", Department of the Army, Office of the Chief of Engineers. The earth dam is 32 feet high and 278 feet long with a crest width of 15 feet. It is in the small size and high hazard potential category. The structure impounds a 5.5 acre lake used for flood control. The embankment has moderate slopes, 1V:3.4H upstream and 1V:2.8H downstream. No signs of uncontrolled seepage or distress was observed.		

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

A bare path has been cut into the downstream slopes by vehicles being driven up the slope. The remainder of the embankment has a well established grass cover. The principal spillway is a 24-inch CMP riser with an 18" CMP outlet. The drawdown facility is a 12" slide headgate located at the base of the riser. The emergency spillway is a 94' wide grassed channel at the right abutment. It was in good condition and appears to have never carried flow. Analyses indicate that the spillway is adequate to pass the recommended 1/2 PMF. The dam is classified as "deficient" due to the presence of an unvegetated area on the downstream slope. It had the appearance that it was well designed and constructed. It is recommended that the owner address several maintenance items including regrassing of the bare path on the downstream slope and removal of small trees along the breakwater fence.

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**DEPARTMENT OF THE ARMY**  
NASHVILLE DISTRICT, CORPS OF ENGINEERS  
P. O. BOX 1670  
NASHVILLE, TENNESSEE 37202

IN REPLY REFER TO

ORNED-G

2 SEP 1981

Honorable Lamar Alexander  
Governor of Tennessee  
Nashville, TN 37219

Dear Governor Alexander:

Furnished herewith is the Phase I Investigation Report on OFDBA Site #41-1 (Glady Hollow Dam) near Lassiter Cornor, Tennessee. The report was prepared under the authority and provisions of PL 92-367, the National Dam Inspection Act, dated 8 August 1972.

The report presents details of the field inspection, background information, technical analyses, findings, and recommendations for improving the condition of the dam.

Based upon the inspection and subsequent evaluation, OFDBA Site #41-1 (Glady Hollow Dam) is classified as deficient due to a barren area on the downstream slope which is subject to deterioration by erosion and the presence of small trees on the upstream slope.

The recommendation for the owner to establish a program for general maintenance and periodic inspection, and others contained in this report should be undertaken in the near future.

Public release of the report and initiation of public statements fall within your prerogative. However, under provisions of the Freedom of Information Act, the Corps of Engineers is required to respond fully to inquiries on information contained in the report and to make it accessible for review on request.

Your assistance in keeping me informed of any further developments will be appreciated.

Sincerely,

LEE W. TUCKER  
Colonel, Corps of Engineers  
Commander

1 Incl  
As stated


CF:  
Mr. Robert A. Hunt, Director  
Division of Water Resources  
4721 Trousdale Drive  
Nashville, TN 37220

PHASE I REPORT  
NATIONAL DAM SAFETY PROGRAM  
TENNESSEE


Name of Dam ..... OFDBA Site 41-1  
(Glady Hollow)  
County ..... Obion  
Stream ..... Trib. of Hornbeak Creek  
Date of Inspection ..... February 4, 1981

This investigation and evaluation was prepared by the  
Tennessee Department of Conservation, Division of Water  
Resources.


Prepared By:

  
Robert Ramsey  
Regional Engineer

Approved By:

  
Edmond O'Neill  
Chief Engineer  
Safe Dams Section

Approved By:

  
Robert A. Hunt, P.E.  
Director, Division of  
Water Resources  
Tennessee Department  
of Conservation



OVERVIEW PHOTOGRAPH

PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM

Name of Dam ..... OFDBA Site #41-1  
(Glady Hollow)  
County ..... Obion  
Stream ..... Trib. of Hornbeak Creek  
Date of Inspection ..... February 4, 1981

ABSTRACT

This report is based on the findings of a Phase I investigation of OFDBA Site #41-1 (Glady Hollow) Dam on February 4, 1981. This study was done in accordance with "Recommended Guidelines for Safety Inspection of Dams", Department of the Army, Office of the Chief of Engineers.

The earth dam is 32 feet high and 278 feet long with a crest width of 15 feet. It is in the small size and high hazard potential category. The structure impounds a 5.5 acre lake used for flood control.

The embankment has moderate slopes, 1V:3.4H upstream and 1V:2.8H downstream. No signs of uncontrolled seepage or distress was observed. A bare path has been cut into the downstream slopes by vehicles being driven up the slope. The remainder of the embankment has a well established grass cover.

The principal spillway is a 24-inch CMP riser with an 18" CMP outlet. The drawdown facility is a 12" slide headgate located at the base of the riser. The emergency spillway is a 94' wide grassed channel at the right abutment. It was in good condition and appears to have never carried flow. Analyses indicate that the spillway is adequate to pass the recommended  $\frac{1}{4}$  PMF.

The dam is classified as "deficient" due to the presence of an unvegetated area on the downstream slope. It had the appearance that it was well designed and constructed. It is recommended that the owner address several maintenance items including regrassing of the bare path on the downstream slope and removal of small trees along the breakwater fence.

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PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
OFDBA GLADY HOLLOW SITE #41-1  
OBION COUNTY, TENNESSEE

SECTION 1 - GENERAL

- 1.1 Authority - The Phase I inspection of this dam was carried out under the authority of Tennessee Code Annotated, Sections 70-2501 to 70-2530, The Safe Dams Act of 1973, and in cooperation with the U. S. Army Corps of Engineers under the authority of Public Law 92-367, The National Dam Inspection Act.
- 1.2 Purpose and Scope - The purpose of a Phase I investigation is to develop an engineering assessment of the general condition of a dam with respect to safety and stability. This is accomplished by conducting a visual inspection, reviewing any available design and construction data, and performing appropriate hydraulic, hydrologic, and other analyses. A comprehensive description of the Phase I investigation program is given in Recommended Guidelines for Safety Inspection of Dams, Department of the Army, Chief of Engineers, Washington, D. C. 20314.
- 1.3 Past Inspections - On December 28, 1977, personnel from the Tennessee Department of Conservation, Division of Water Resources, performed a visual inspection of the dam pursuant to the issuance of a Certificate of Approval and Safety for operation of the structure in accordance with the provisions of the Safe Dams Act of 1973. The dam was noted to be in good condition except for some minor erosion caused by lack of a good vegetative cover. The operation certificate was issued on February 8, 1978.
- 1.4 Details of Inspection - The Phase I inspection was conducted on February 4, 1981. The weather was clear with temperatures in the low 30's. The lake was approximately at normal pool, elevation 390' msl.

1.5 Inspection Team Members - The inspection was conducted by the following State personnel:

Robert Ramsey, Regional Engineer  
George Moore, Regional Engineer

The inspection team was accompanied and briefed by Bill Owens and Joe Kerley of the Obion-Forked Deer Basin Authority, which planned and funded the project.

## SECTION 2 - PROJECT DESCRIPTION

- 2.1 Location - The dam is located in Obion County, Tennessee, about 3 miles northwest of the community of Hornbeak near the head of Glady Hollow. It is located (not shown) on the U.S. Geological Survey 7.5 minute Hornbeak quadrangle map at north latitude  $36^{\circ}20'23''$  and west longitude  $89^{\circ}30'52''$ . Location maps are provided in Appendix B.
- 2.2 History of Project - The dam was built to provide flood and sediment control in the Obion-Forked Deer River Basin. It was designed by Continental Engineering, Inc. and constructed by Brewer Construction Company under contract with the Obion-Forked Deer Basin Authority. The Basin Authority is a State of Tennessee government agency created in 1972 to develop and implement plans and programs regarding floodplain development including the control and development of water and related land resources of the Obion-Forked Deer Basin. The owner of the dam is Mr. Rodney Truett, Route 1, Hornbeak, Tennessee, who is responsible for general maintenance and operation. Easement rights for the lake and dam site are retained by the OFDBA, which has the ultimate responsibility for maintenance and other corrections of any deficiencies.

A Certificate of Approval and Safety for construction was issued to the Basin Authority by the Tennessee Department of Conservation in January of 1977, as required by the Tennessee "Safe Dams Act of 1973". Construction of the dam was completed in late November of 1977 in accordance with approved plans and specifications. In late December 1977, Conservation personnel examined the dam and it was reported to be in good condition except for some minor erosion on the embankment. A Certificate for Operation was issued in February of 1978.

- 2.3 Size and Hazard Classification - According to OCE guidelines, the dam is in the small size category with a height of 32 feet and a storage capacity of 35 acre-feet at normal pool level and 135 acre-feet at the top of the dam. The structure is classified in the high hazard potential category because sudden failure of the dam would cause extensive damage to two family dwellings located immediately downstream and would probably result in loss of life (photo no. 10). In addition, approximately seven other family dwellings are located within one mile downstream.

## 2.4 Description of Dam and Appurtenances

2.4.1 Embankment - The embankment is a linear aligned homogeneous earthfill structure constructed of loessial material. It has a maximum structural height of 32.3 feet, measured from the low point on the crest to the streambed. The crest is 278 feet long, 15 feet wide, and varies in elevation from 392.0 to 393.0. The upstream slope is 3.4H:1V. It is protected from wave action by a breakwater fence constructed of 2" x 12" treated boards (photo no. 2). The downstream slope is 2.8H:1V (photo no. 7). There is a short 12 foot wide berm at the maximum section above the drain pipe. Sketches of the dam and appurtenances are provided in Appendix B.

According to design drawings, a toe drain consisting of a graded sand filter is provided with two 6" diameter perforated fiber collection pipes wrapped in filter cloth. The dam is situated near the edge of the loess bluffs in northwest Tennessee that overlooks Reelfoot Lake to the west. These bluffs consist of thick wind-blown deposits of clayey silt. Loessial deposits in this area are generally greater than 50 feet thick. These soils are highly erodible but suitable for impervious fills with proper compaction. A detailed geotechnical investigation of the site, including test borings, was performed by Spigolon Engineering Laboratories, Inc. in accordance with the original design and is included in Appendix G.

2.4.2 Principal Spillway - The principal spillway consists of a 24-inch diameter corrugated metal pipe riser with a 42-inch diameter corrugated metal pipe anti-vortex baffle (photo no. 3). According to plans, the riser is supported by two creosote treated wooden posts anchored by 3.5 cubic yards of class B concrete. The outlet pipe consists of 170 feet of 18-inch diameter corrugated metal pipe. The pipe has a paved invert and is laid on a 2% slope. A flared end section is provided at the outlet.

2.4.3 Drawdown Facility - The drawdown facility is a manually operated 12" slide gate on a 12" diameter corrugated metal pipe intake located at the base of the riser.

2.4.4 Emergency Spillway - The emergency spillway is a 94-foot wide grassed channel excavated from the right abutment. The side slopes are 5.5H:1V and 3.7H:1V (Sheet 3 of 5, Appendix B). The entrance and exit channel slopes are approximately 3% (photo nos. 5 & 6).

2.4.5 Downstream Channel - The outlet channel from the dam intercepts the original drainage channel about 75 feet downstream of the dam. The channel consists of grouted riprap extending about 50 feet from the pipe outlet followed by unlined excavated earth to the natural channel (photo nos. 8 & 10).

2.4.6 Reservoir and Drainage Area - At normal pool, elevation 380, the dam impounds a reservoir having a surface area of 5.5 acres and a storage capacity of about 35 acre-feet. At flood pool, the crest of the emergency spillway, the reservoir is 9.1 acres and the storage capacity is approximately 85 acre-feet.

Slopes in the 154 acre (0.24 sq. mi.) drainage area average about 12%. According to published soil surveys, the predominant soil in the drainage area is the Memphis silt loam.

## SECTION 3 - FINDINGS

### 3.1 Visual Findings

3.1.1 Embankment - The embankment is protected by a dense grass cover (sericea-lespidiza). The crest and slopes are uniform and showed no signs of structural distress. Minor erosion was noted at the toe and there is a roadway on the downstream slope, apparently caused by vehicles (photo no. 9). One small animal burrow was located on the upper portion of the downstream slope near the left abutment (photo no. 4). A few small trees are growing on the upstream slope along the breakwater fence (photo no. 1).

There was no evidence of uncontrolled seepage. A small clear flow (less than 1 gpm) was issuing from the left toe drain outlet and both drains had small deposits of silt at the invert.

A soil sample taken from the embankment was found to be a brown silty clay classified as CL material according to the Unified Soil Classification System. The sample was tested for Atterberg limits and was found to have a liquid limit of 32.6 and a plastic index of 9.5. Fill for the embankment was obtained from the emergency spillway excavation.

3.1.2 Principal Spillway - The riser pipe was not inspected. The exposed anti-vortex baffle appeared to be in good condition. There was a trickle of water at the outlet, presumably coming through the riser.

3.1.3 Emergency Spillway - The emergency spillway has a dense grass cover and is in good condition. A few small erosion gullies were observed in the channel, probably caused by surface runoff. There was no evidence that flow has ever passed through the spillway. The spillway is positioned such that any discharge would not impinge on the toe of the dam.

3.1.4 Drawdown Facility - The drain gate was not operated during the inspection. According to the Basin Authority, the gate has not been operated since it was closed for filling the reservoir. The operating wheel is reportedly housed by the landowner, Mr. Rodney Truett.

3.1.5 Downstream Channel - The downstream channel was in good condition and contained no significant obstructions or debris. The grouted riprap portion of the channel below the drain pipe has been undermined and is beginning to break. It does not appear to be a serious problem at this time (photo no. 8).

3.1.6 Reservoir and Drainage Area - The reservoir showed no significant evidence of sedimentation and the turbidity was low. Reservoir slopes appeared generally steep.

Major land use in the drainage area is row crop farming. Idle land is mostly wooded. There have been no significant changes in land use since the dam was constructed in 1977.

- 3.2 Review of Data - Information available for review included design drawings, specifications, an engineering report, a geotechnical investigation report, and related correspondence concerning certification by the Tennessee Department of Conservation. Copies of the design drawings and the geotechnical investigation report are provided in Appendix E.

The geotechnical report states that the dam is located in an erosional valley consisting of a thick deposit of loessial soil classified as a clayey silt. Hand auger borings were made to depths of 12' along the centerline of the dam. No pervious strata were encountered and the soil was described as being of low plasticity and having a low permeability. Logs of the borings are contained in the report.

- 3.3 Static and Seismic Stability - The actual margin of safety for static stability cannot be determined because the engineering data required for analytical stability analyses are not available. An assessment of the embankment stability based on visual evidence and engineering judgment indicate a stable structure due to moderate embankment slopes and the absence of leaks or seepage. The project is located in Seismic Zone 3, indicating that there could be major damage from seismic activity in the area. The original design of the dam included allowances for earthquake stresses.

3.4 Hydraulic and Hydrologic Analysis - According to OCE guidelines, the recommended minimum design flood for a small size dam in a high hazard potential area is one-half of the Probable Maximum Flood ( $\frac{1}{2}$ PMF). Hydraulic and hydrologic analyses indicate that the dam has sufficient storage/spillway capacity to pass the  $\frac{1}{2}$ PMF (AMC II) with 2.7 feet of freeboard and that the dam has sufficient storage/spillway capacity to pass the PMF (AMC II) with 1 foot of freeboard.

3.4 Conclusions and Recommendations

3.5.1 Conclusions

- a. The dam appears to be stable and in good condition. It has the appearance that it is well aligned and constructed.
- b. Hydraulic and hydrologic analyses indicates that the storage/spillway capacity is adequate to pass the one-half probable maximum flood as recommended by OCE guidelines for dams of small size and high hazard potential.
- c. No signs of instability were observed.
- d. The dam has a condition classification of "deficient" because of the presence of a vehicular path on the downstream slope.

3.5.2 Recommendations - The owner should:

- a. Regrass bare areas on the downstream slope and construct a barrier to keep vehicles off the embankment.
- b. Remove all trees from the upstream slope.
- c. Establish a program for general maintenance and periodic inspection.
- d. Repair grouted riprap in the impact basin as needed.
- e. Develop an emergency action plan to alert downstream residents in the event a serious condition develops within the project.

#### SECTION 4 REVIEW BOARD FINDINGS

The Interagency Review Board for the National Program of Inspection of Non-Federal Dams met in Nashville on 21 May 1981 to examine the technical data contained in the Phase I investigation report on OFDBA Site #41-1 (Glady Hollow Dam). The Review Board considered the information and concurred with the reports conclusions and recommendations. A copy of the Review Board's letter report is included in Appendix G.

**APPENDIX A**  
**DATA SUMMARY**

APPENDIX A  
DATA SUMMARY

A.1 Dam

A.1.1 Type - Earthfill

A.1.2 Dimensions and Elevations - Elevations are expressed in feet and are referenced from the invert of the drain pipe, shown on the plans to be elevation 364.0 feet.

- a. Crest length - 278'
- b. Crest width - 15'
- c. Height - 32.3'
- d. Crest elevation (low point) - 392.0'
- e. Embankment slope, U/S - 3.4H:1V
- f. Embankment slope, D/S - 2.8H:1V
- g. Size classification - Small

A.1.3 Zones, Cutoffs, Grout Curtains - 15' keyway cut into earth and extending 2 feet below dam foundation

A.1.4 Instrumentation - None

A.2 Reservoir and Drainage Area

A.2.1 Reservoir

a. Normal Pool

- 1) Elevation - 380'
- 2) Surface area - 5.5 acres
- 3) Storage - 35 acre-feet

b. Flood Pool (Crest of emergency spillway)

- 1) Elevation - 387.2'
- 2) Surface area - 9.1 acres
- 3) Storage - 85 acre-feet

c. Maximum Pool (Top of dam)

- 1) Elevation - 392'
- 2) Storage - 135 acre-feet

A.2.2 Drainage Area

- a. Size - 154 acres
- b. Average slope - 12%
- c. Soils - Memphis silt loam
- d. Land use - Row crops, woods
- e. Runoff (AMC II)
  - 1) PMF - 24.1 inches
  - 2)  $\frac{1}{4}$  PMF - 12.05 inches
  - 3) 100-year flood - 5.2 inches

A.3 Outlet Structures

A.3.1 Drawdown Facilities

- a. Type - 12" slide headgate
- b. Control - Manual

A.3.2 Service Spillway

- a. Type - 24" diameter CMP riser; 18" CMP outlet
- b. Crest elevation - 380'

A.3.3 Emergency Spillway

- a. Type - Saddle, vegetated earth
- b. Bottom width - 94'
- c. Crest elevation - 387.2

A.4 Historical Data

A.4.1 Construction Date - November 1977

A.4.2 Designer - Continental Engineering, Inc.

A.4.3 Builder - Obion-Forked Deer Basin Authority  
Brewer Construction Company

A.4.4 Owner - Rodney Truett

A.4.5 Previous Inspections - Tennessee Department  
of Conservation  
December 28, 1977

A.4.6 Seismic Zone - 3

A.5 Downstream Hazard Data

A.5.1 Downstream Hazard Potential Classification

- a. Corps of Engineers - High
- b. State of Tennessee - 1

A.5.2 Persons in Likely Flood Path - Estimated  
27 persons living within 1 mile downstream.

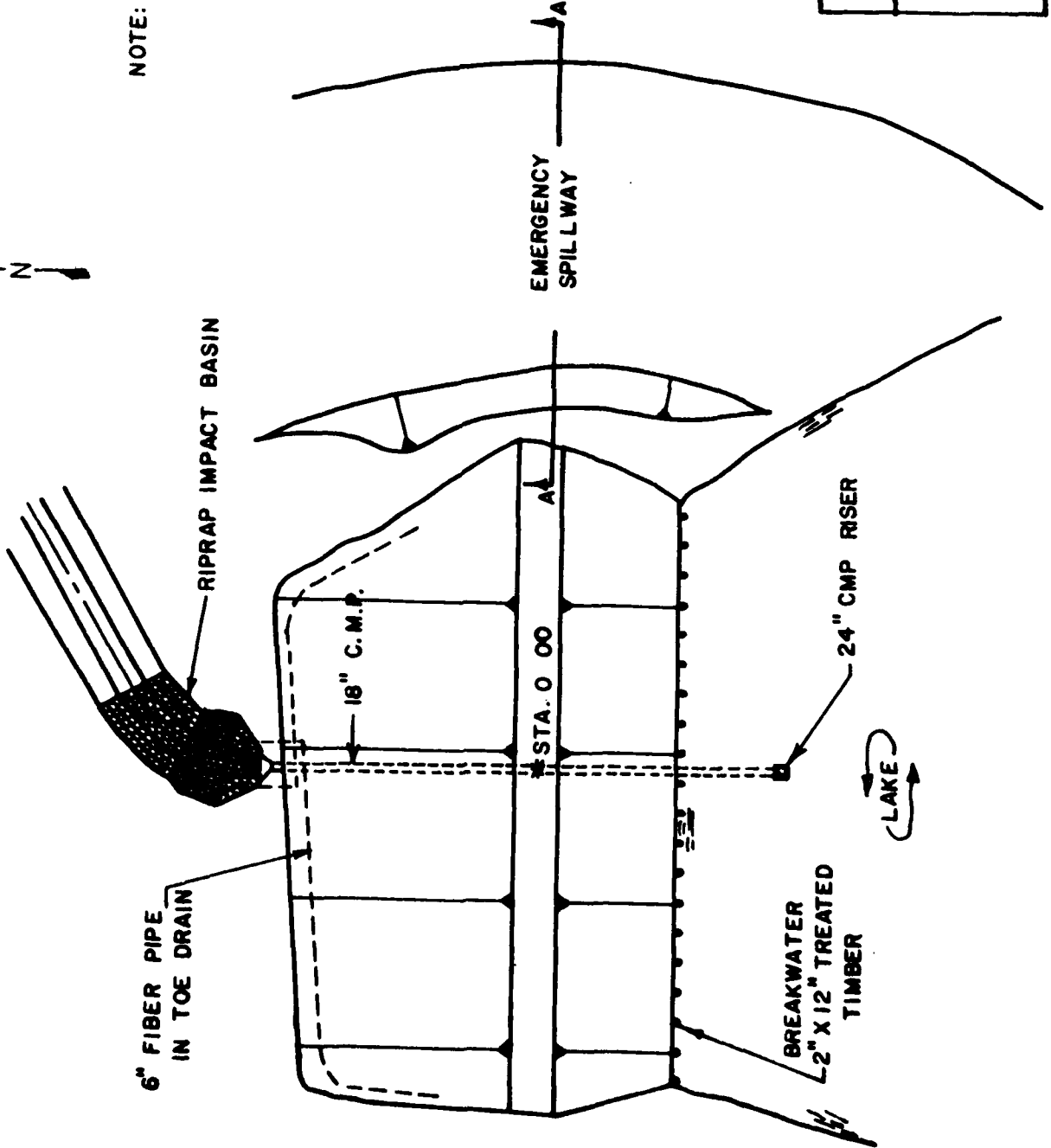
A.5.3 Downstream Property - Nine family dwellings

A.5.4 Warning Systems - None

**APPENDIX B**  
**SKETCHES AND LOCATION MAPS**

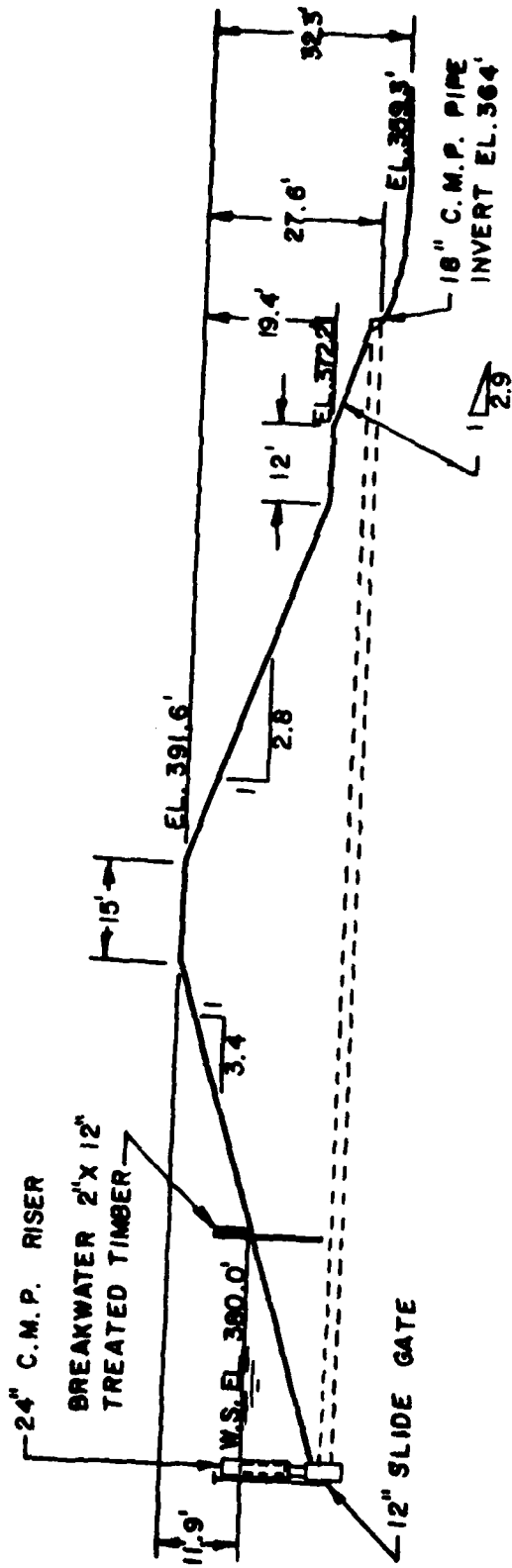


NOTE: T.B.M. (EL. 385.0') IS TOP  
 OF POST OF WAVE  
 PROTECTION AT STA.  
 0+00 ON U/S SLOPE.  
 ELEVATIONS REFERENCED  
 TO PIPE INVERT, ELEV.  
 364.0'.



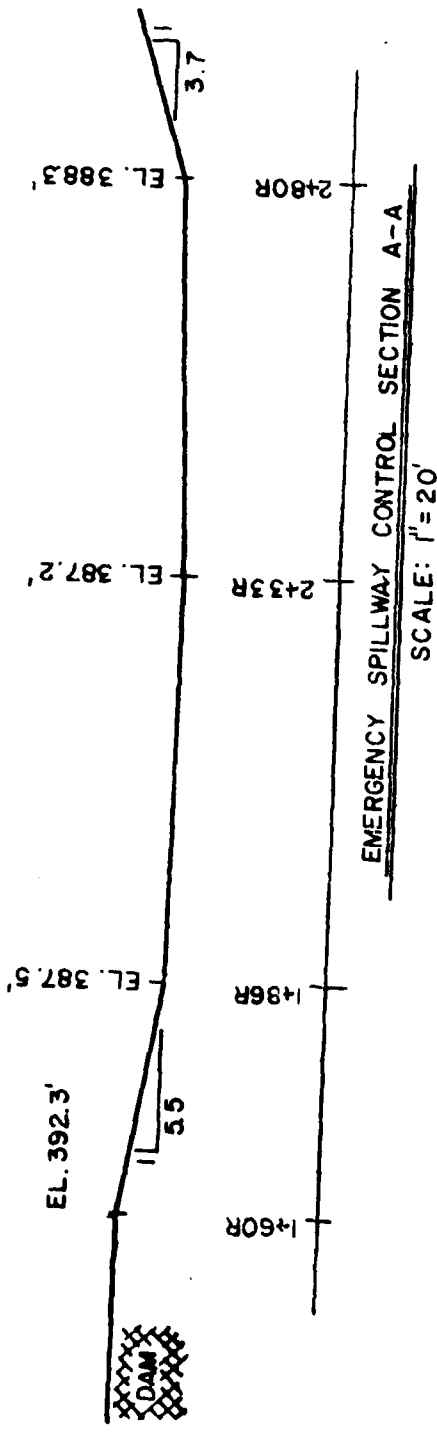
GENERAL PLAN  
 SCALE: 1"=60'

GLADY HOLLOW SITE 41-1
DRAWN BY: M.J.F. DATE: 9 APR. 81 SHEET: 1 OF 5

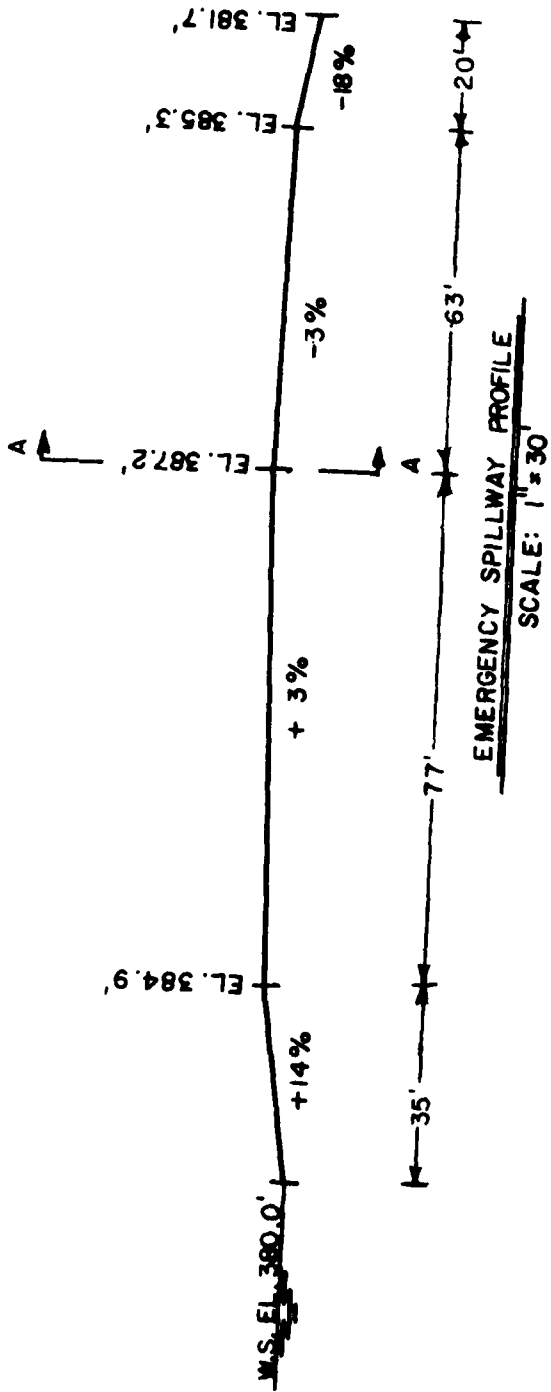


MAXIMUM SECTION  
 SCALE: 1" = 25'

GLADY HOLLOW  
 SITE 41-1  
 DRAWN BY: M.J.F.  
 DATE: 3 MAR 61  
 SHEET: 2 OF 5



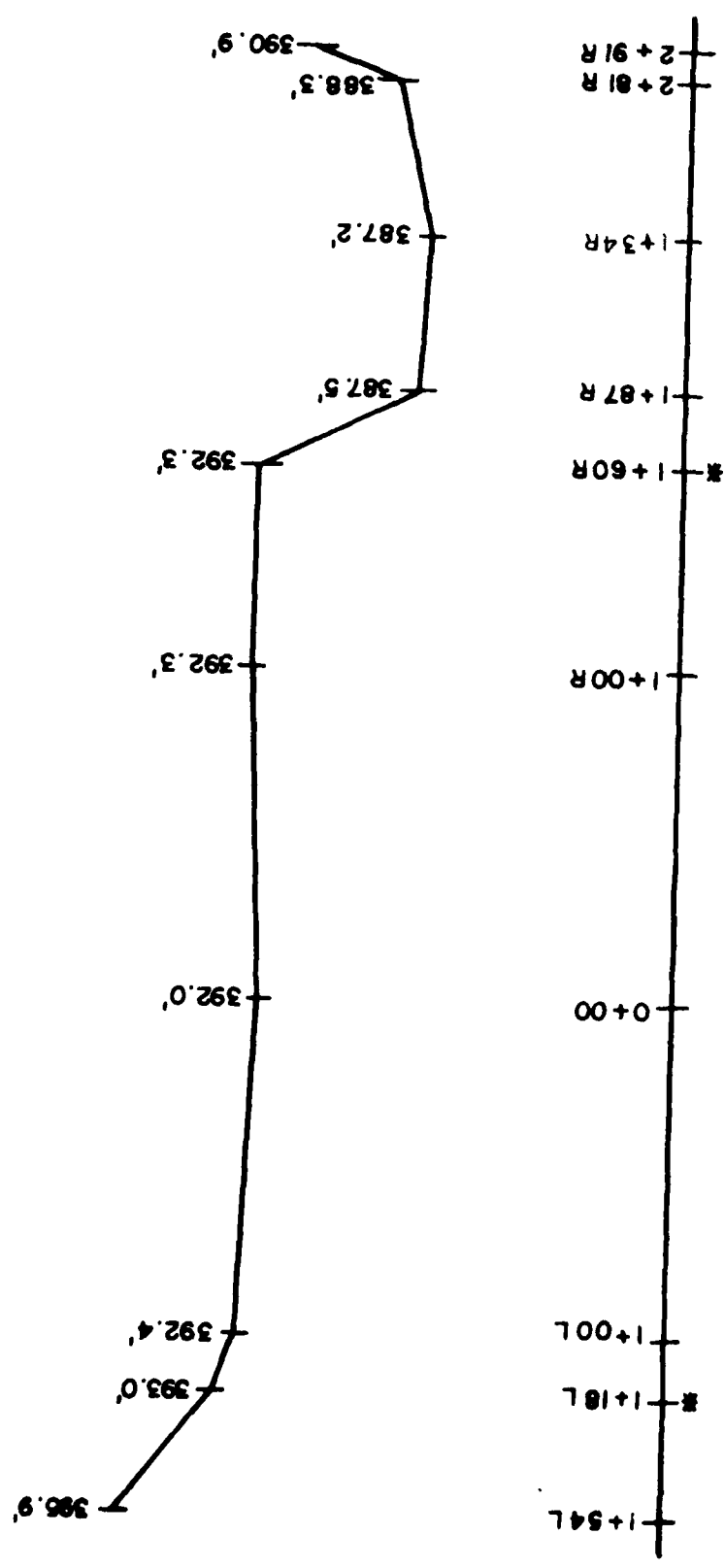
GLADY HOLLOW SITE 41-1
DRAWN BY: M.J.F. DATE: 3 MAR 81 SHEET: 3 OF 5



**EMERGENCY SPILLWAY PROFILE**  
 SCALE: 1" = 30'

GLADY HOLLOW SITE 41-1
DRAWN BY: M.J.F. DATE: 3 MAR 81 SHEET: 4 OF 5

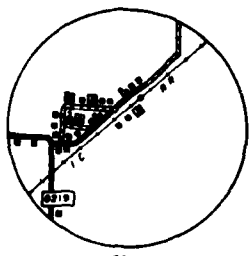
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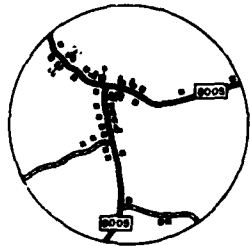
CREST & PROFILE  
H. SCALE: 1"=50'  
V. SCALE: 1"=5'

# END OF DAM

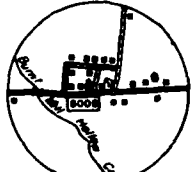
36°30'



POLK  
1



ELBRIDGE  
2



GLASS  
3

36°25'

36°20'

36°15'



TO HICKMAN KY  
FULTON

K

TO HICKMAN KY

COUNTY

REELFOOT NATIONAL WILDLIFE REFUGE  
REELFOOT WILDLIFE MANAGEMENT AREA (STATE)

REELFOOT WILDLIFE MANAGEMENT AREA (STATE)

DAM SITE

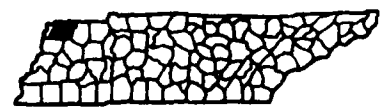
REELFOOT LAKE STATE PARK

LAKE

TO MADIE

TO RIDGELY

TO Tiptonville



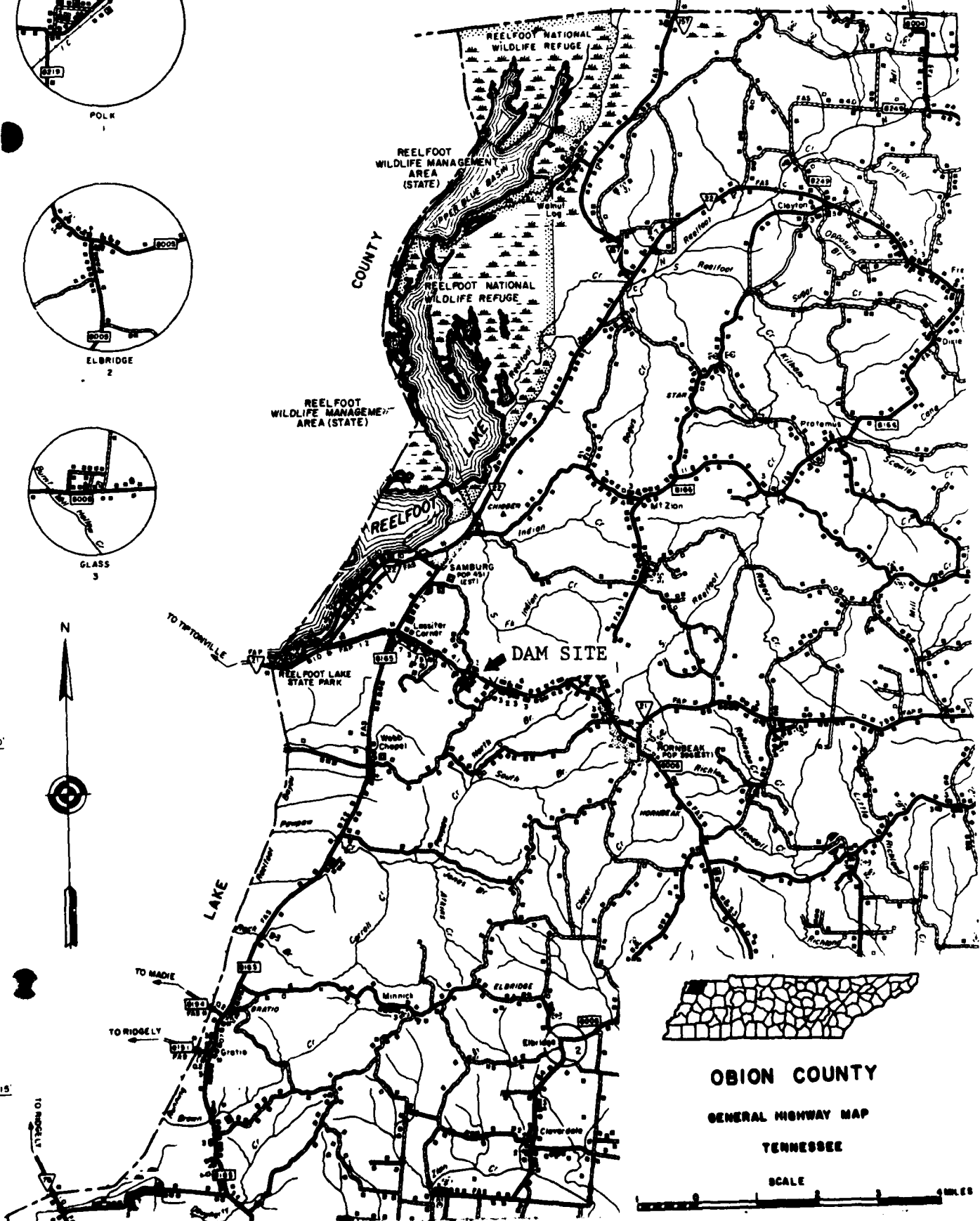
OBION COUNTY

GENERAL HIGHWAY MAP

TENNESSEE

SCALE

MILES



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

89° 22' 30"  
1' 30"

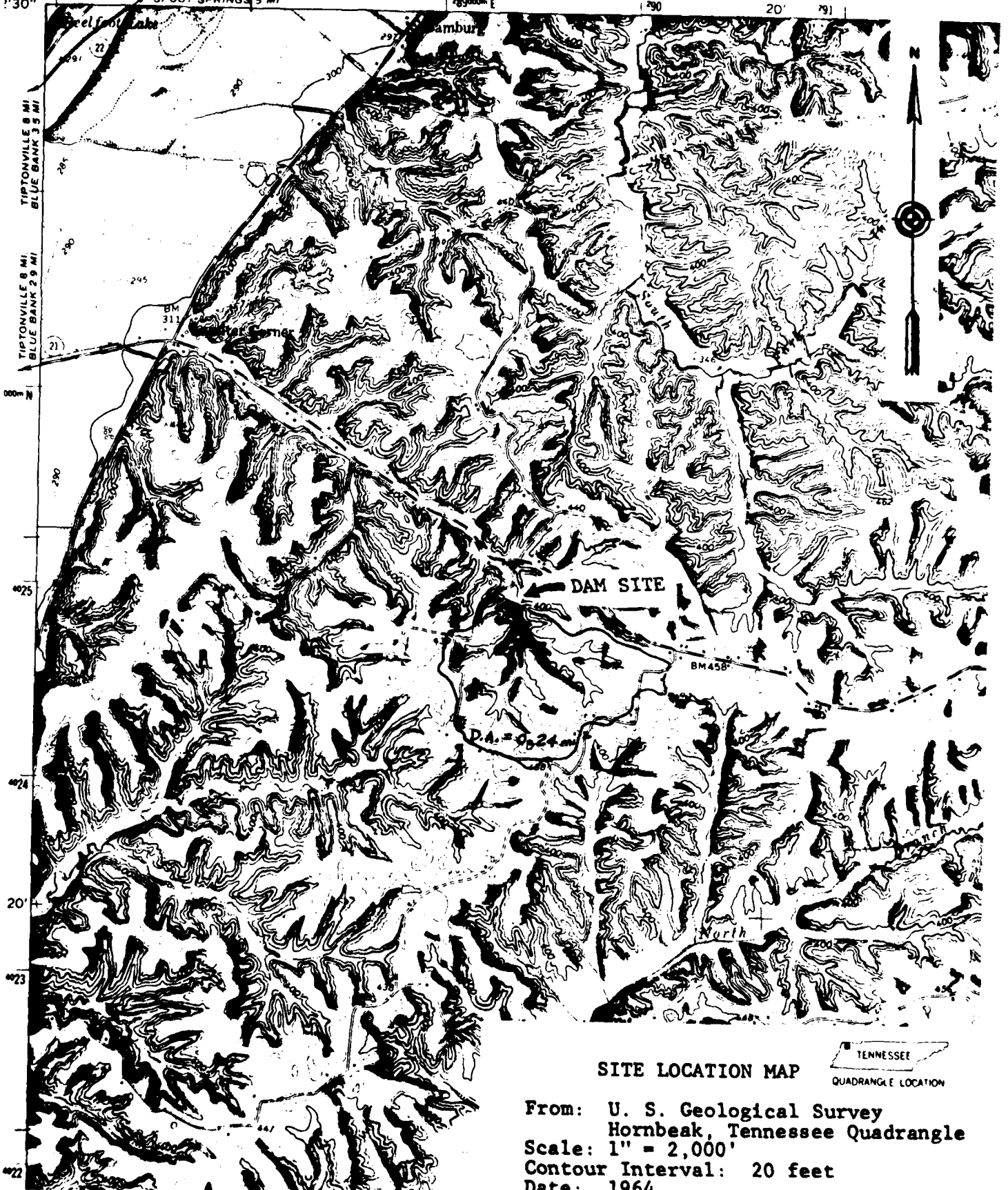
UNION CITY 21 MI  
SPOUT SPRINGS 5 MI

2890000 E

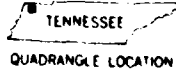
1790

20'

791



SITE LOCATION MAP



From: U. S. Geological Survey  
Hornbeak, Tennessee Quadrangle  
Scale: 1" = 2,000'  
Contour Interval: 20 feet  
Date: 1964

**APPENDIX C**  
**PHOTOGRAPHIC RECORD**

### Photographic Log

- Photo No. 1 - The upstream slope as viewed from the left abutment.
- Photo No. 2 - View of the breakwater fence along the upstream slope.
- Photo No. 3 - View of the principal spillway riser and anti-vortex baffle.
- Photo No. 4 - A small animal burrow located on the upper part of the downstream slope near the left abutment.
- Photo No. 5 - The emergency spillway entrance channel at the right abutment.
- Photo No. 6 - The emergency spillway control section and exit channel.
- Photo No. 7 - The downstream slope of the dam as viewed from the emergency spillway exit channel.
- Photo No. 8 - View of the principal spillway outlet and impact basin. The two toe drain outlets are visible near the bottom of the photo.
- Photo No. 9 - View of a bare area on the downstream slope caused by vehicles being driven up the slope.
- Photo No. 10 - View of two family dwellings located immediately downstream of the dam.



PHOTO NO.1



PHOTO NO.2



PHOTO NO. 3

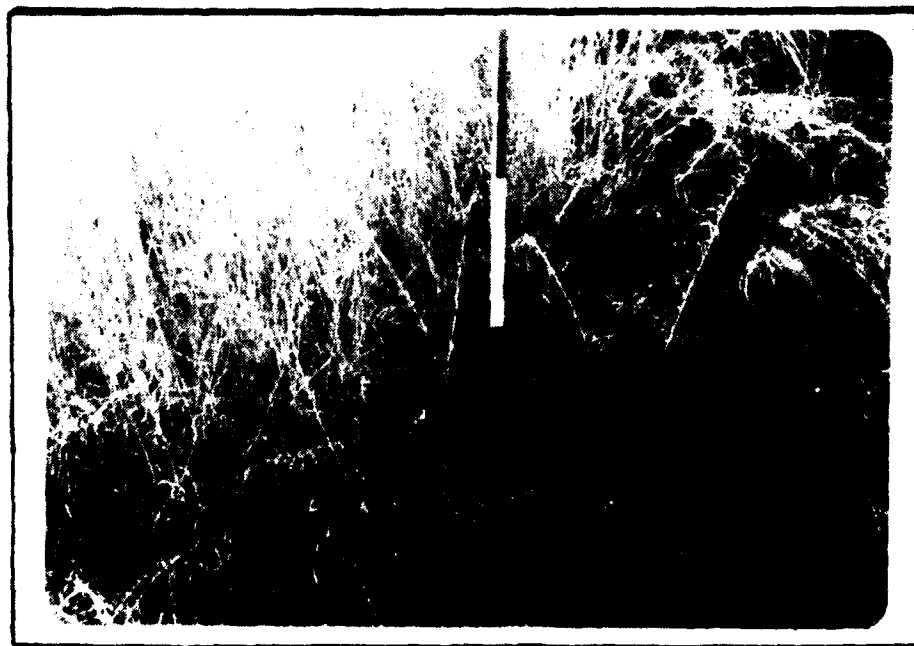


PHOTO NO. 4



PHOTO NO. 5

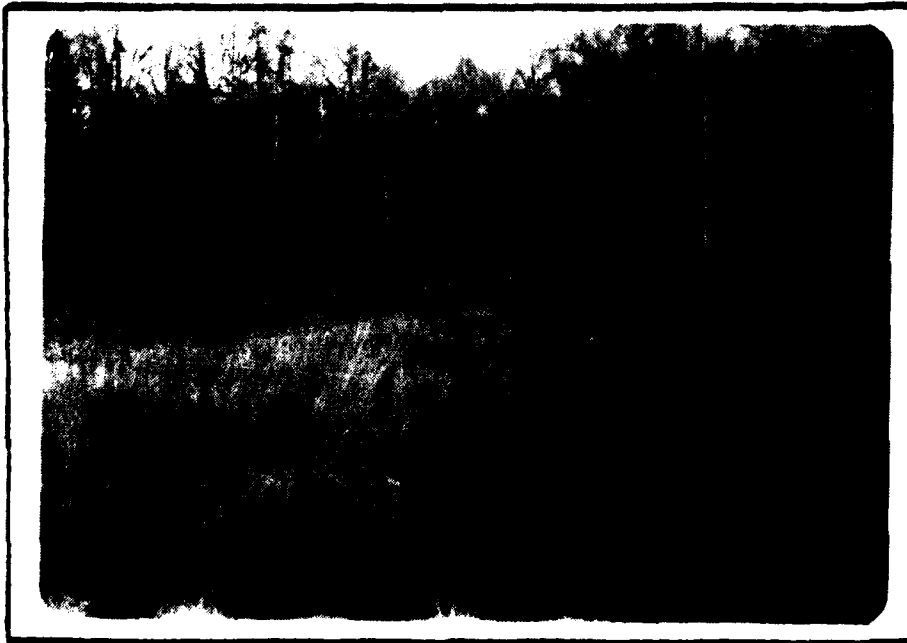


PHOTO NO. 6



PHOTO NO. 7



PHOTO NO. 8



PHOTO NO. 9



PHOTO NO. 10

APPENDIX D  
TECHNICAL CRITIQUES  
AND  
INSPECTION CHECKLIST

Check List  
Visual Inspection of Earth Dams  
Department of Conservation  
Division of Water Resources

Name of Dam Glady Hollow Site 41-1

County Obion Date of Inspection February 4 1981

ID # - State 66-7014 Federal TN 13113

Type of Dam Earth

Hazard Category-Federal High State 1

Weather Clear, slightly windy Temperature 30°F

Pool at Time of Inspection 12' (distance from crest)

Tailwater at Time of Inspection 0 (distance from stream bed)

Design/As Built Drawings Available: Yes X No     

Location: TDWR and OFDRBA

Copy Obtained: Yes x No     

Reviewed: Yes x No     

Construction History Available: Yes x No     

Location: OFDBA

Copy Obtained: Yes      No x

Reviewed: Yes      No x

Other Records and Reports Available: Yes      No x

Location:     

Copy Obtained: Yes      No     

Reviewed: Yes      No     

Prior Incidents or Failures: Yes      No x

Inspection Personnel and Affiliation:

Bob Ramsey - TDWR     

George Moore - TDWR     

Gene Davis - TDWR     

Anthony Privett - TDWR

**I. Embankment**

**A. Crest**

Description (1st inspection) Uniform, good grass  
cover.

1. Longitudinal Alignment Linear

2. Longitudinal Surface Cracks None

3. Transverse Surface Cracks None

4. General Condition of Surface Good condition.

5. Miscellaneous \_\_\_\_\_

**B. Upstream Slope**

1. Undesirable Growth or Debris A few small trees  
along upstream slope behind breakwater wall.

2. Sloughing, Subsidence, or Depressions None

3. Slope Protection Thick weed and grass cover. Wooden  
breakwater wall at normal pool.

a. Condition of Riprap N/A

b. Durability of Individual Stones N/A

c. Adequacy of Slope Protection Against Waves  
and Runoff Adequate

d. Gradation of Slope Protection - Localized Areas  
of Fine Material N/A

4. Surface Cracks None

C. Downstream Slope

1. Undesirable Growth or Debris None

2. Sloughing, Subsidence, or Depressions; Abnormal  
Bulges or Non-Uniformity Slight erosion at toe.  
Vehicles being driven up downstream slope have caused a bare path up slope with associated erosion. One small animal burrow at upper left downstream slope.
3. Surface Cracks on Face of Slope None
4. Surface Cracks or Evidence of Heaving at  
Embankment Toe None
5. Wet or Saturated Areas or Other Evidence of Seepage  
on Face of Slope; Evidence of "Piping" or "Boils"  
None
6. Drainage System Slight flow from left toe drain.  
Small soil buildup in left drain.
7. Fill Contact with Outlet Structure Good condition.
8. Condition of Grass Slope Protection Adequate, tall  
grass or weed cover.

**D. Abutments**

1. Erosion of Contact of Embankment with Abutment from  
Surface Water Runoff, Upstream or Downstream None

---

---

2. Springs or Indications of Seepage Along Contact of  
Embankment with the Abutments None

---

---

3. Springs or Indications of Seepage in Areas a Short  
Distance Downstream of Embankment - Abutment Tie-in  
None

---

---

---

II. Area Downstream of Embankment, Including Channel

A. Localized Subsidence, Depressions, Sinkholes, Etc. \_\_\_\_\_

None

B. Evidence of "Piping", "Boils", or "Seepage" \_\_\_\_\_

None

C. Unusual Presence of Lush Growth, such as Swamp  
Grass, etc. \_\_\_\_\_ None

D. Unusual Muddy Water in Downstream Channel \_\_\_\_\_ None

E. Sloughing or Erosion \_\_\_\_\_ None

F. Surface Cracks or Evidence of Heaving Beyond  
Embankment Toe \_\_\_\_\_ None

G. Stability of Channel Sideslopes \_\_\_\_\_ Fair, some minor  
erosion.

H. Condition of Channel Slope Protection \_\_\_\_\_ No protection.  
Grouted riprap just below drain pipe is being undermined.

I. Adequacy of Slope Protection Against Waves, Currents,  
and Surface Runoff Adequate

J. Miscellaneous

K. Condition of Relief Wells, Drains, and Other  
Appurtenances N/A

L. Unusual Increase or Decrease in Discharge from  
Relief Wells N/A

III. Instrumentation

A. Monumentation/Surveys Could not located BM shown on  
plans.

B. Observation Wells N/A

C. Weirs N/A

D. Piezometers N/A

E. Other N/A

**IV. Spillways**

**A. Service Spillway (Service/Emergency Combination Yes \_\_\_ No X)**

1. Intake Structure Condition Submerged. Section  
exposed appeared to be in good condition.

2. Outlet Structure Condition Good condition.

3. Pipe Condition Unknown.

4. Evidence of Leakage or Piping None

5. General Remarks Grouted riprap below pipe is being  
undermined.

**B. Emergency Spillway**

1. General Condition Good condition. Thick grass  
cover.

2. Entrance Channel A few small gullies. Not signifi-  
cant. Probably due to surface runoff.

3. Control Section No erosion. No obstructions.

3. Exit Channel Good condition

\_\_\_\_\_

\_\_\_\_\_

4. Vegetative/Woody Cover Grass cover.

\_\_\_\_\_

\_\_\_\_\_

5. Other Observations \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

V. Emergency Drawdown Facilities (if part of service spillway  
so state) Slide gate at base of riser. Landowner has operating  
wheel.

---

Are Facilities Operable: Yes X No       

Were Facilities Operated During Inspection: Yes        No X

Date Facilities Were Last Used December 1977 when lake was filled.

VI. Reservoir

A. Slopes Moderate to steep.

\_\_\_\_\_  
\_\_\_\_\_

B. Sedimentation Unknown

\_\_\_\_\_  
\_\_\_\_\_

C. Turbidity Low

\_\_\_\_\_  
\_\_\_\_\_

VII. Drainage Area

Description (for hydrologic analysis) Row crop farming  
and wooded areas.

\_\_\_\_\_  
\_\_\_\_\_

A. Changes in Land Use None

\_\_\_\_\_  
\_\_\_\_\_

VIII. Downstream Area (Stream)

A. Condition (obstructions, debris, etc.) None

\_\_\_\_\_  
\_\_\_\_\_

B. Slopes Gradual

\_\_\_\_\_  
\_\_\_\_\_

C. Approximate No. Homes, Population, and Distance D/S

One house immediately downstream.

(See report)

\_\_\_\_\_  
\_\_\_\_\_

D. Other Hazards \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**IX. Miscellaneous**

Incidents/Failures None reported

Observed Geology of Area Dam located near loess bluff.

**X. Conclusions**

Dam is in good condition and stable.

**XI. Recommendations**

1) Keep vehicles off embankment and repair and regrass  
eroded portions.

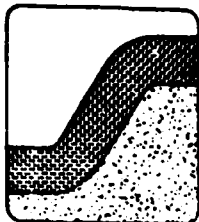
2) Mow grass at regular intervals to allow inspection and  
remove trees along upstream slope.

3) Repair grouted riprap in impact basin as needed.

*Robert Ramsey*  
Regional Engineer

Chief Engineer

APPENDIX E  
REVIEW OF AVAILABLE DESIGN DRAWINGS  
AND  
CONSTRUCTION DOCUMENTS



November 5, 1976  
Job No, G-260  
Serial No, N-231

## SPIGOLON ENGINEERING LABORATORIES/ INC.

Obion-Forked Deer Basin Authority  
c/o Continental Engineering, Inc.  
Suite 501, Directors Plaza  
3035 Directors Row  
Memphis, Tennessee 38131

GEOTECHNICAL INVESTIGATION  
Lake & Dam 41-1, Glady Hollow  
Obion County, Tennessee

Gentlemen:

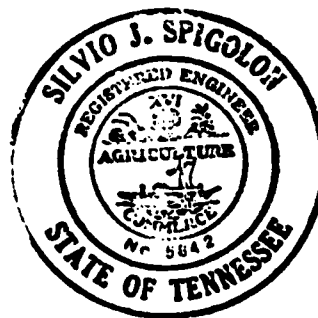
In compliance with your request, we have performed a site investigation for the referenced project. The results of the investigation are enclosed. The reported data consist of logs of test borings, performed in accordance with the specified locations and depths and results of laboratory tests.

We appreciate the opportunity to work with you on this project and look forward to working with you again in the future.

Sincerely yours,  
SPIGOLON ENGINEERING LABORATORIES, INC.

S. J. Spigolon, P. E.  
President

SJS/db



## INTRODUCTION

EMPH'S P. 0. 3  
SPRINGBORO, TENN. 37201  
CASH INVESTMENT  
12/1/56

### Purpose and Scope

An earth fill detention dam is proposed in the valley of Glady Hollow in Obion County, Tennessee. This report presents the results of a subsurface investigation along the center line of the proposed dam. An investigation of borrow materials was made separately and is not included herein. Recommendations for embankment design and fill compaction are presented below.

### Description of Project

The proposed dam site is located on Glady Hollow, roughly six miles west of Hornbeak, in Obion County, Tennessee. The site is located near the edge of the loess bluff overlooking Reelfoot Lake to the west. The proposed dam will be 23 feet high above the valley bottom and will impound 18 feet of water at maximum pool. Bottom elevation is 369, maximum pool elevation is 387, and crest of dam is at elevation 392. The top of the dam will be about 450 feet long. The crest of the hill at the right abutment will be excavated to provide borrow for the dam and to provide for the emergency spillway.

## SITE INVESTIGATION

### Test Borings

Because of the relatively small height of the dam, and the somewhat simple geology of the area, the field investigation was limited to hand auger borings of fairly shallow depth. It was felt that the engineering properties of the soils encountered, including strength, compressibility, and permeability, could be estimated from a visual classification and observation of the disturbed auger samples.

Locations of the embankment borings are shown on the enclosed Soil Profile sheet. Borings B-1 and B-3 were made at the abutments at maximum pool level. Borings B-2 and B-4 were made in the valley bottom. Boring B-5 was made 200 upstream in the center of the valley for the purpose of verifying the existence or absence of a major seepage layer at a shallow depth.

Several additional borings were made in the upstream valley bottom and ridge tops by personnel from Continental Engineering Inc. for the purpose of borrow pit investigation. Although this writer assisted in the visual classification of those soils, no formal boring logs were maintained by this writer and no information regarding quantities or locations of proposed borrowed materials are given in this report.

The project site is located in an erosional valley near the bluff line of the Loess Hills in northwest Tennessee. The geologic formation of the loess bluffs consisted of deposition of a clayey silt deposited by wind action after drying in the nearby flood plain. At the bluff line, the deposit of loessial soil tends to be well over 50 feet thick and the bluff line is well over 100 feet above the nearby flood plain. A recently made test boring at Samburg, a few miles north of the project, disclosed 80 feet of firm to stiff clayey silt.

Logs of the hand auger borings are attached. As may be seen on the soil profile sheet, the borings encountered only a brown or tan clayey silt, consistent with the local geology. No pervious valley bottom strata were encountered. At the bottom of the existing ditch, in boring B-4, the loess exhibited a slightly sandier characteristic than in other borings. This is probably because of the sorting action of water which has removed some of the clay. In summary, the entire soil profile to a depth of 12 feet along the center line of the dam and 200 feet upstream consists of a firm to stiff brown clayey silt. This soil is of low plasticity and has a permeability normally in the range of 0.00001 cm/sec. The only detrimental feature of this type of soil is its extreme susceptibility to erosion.

#### EMBANKMENT DESIGN RECOMMENDATIONS

##### General Statement

The test borings and laboratory tests are indicative of soil conditions at the locations of the individual test borings. Although every effort has been made to interpret this data giving due consideration to the known geology of the area and to previous experience with soils in this area, no guarantee can be made or implied regarding the engineering properties or stratification of the soils between test boring locations.

##### Embankment Cross-Section

A recommended embankment design cross-section is shown on the enclosed Figure 2. The test boring and the geologic data indicate that there is little likelihood of encountering a highly pervious layer within the valley bottom to a depth of 12 feet, and probably to many tens of feet more. Therefore, underseepage and sidesepage should not be a problem at this site. Available borrow materials from the spillway excavation will be the same clayey silt forming the entire soil profile. These soils can be easily compacted into a relatively impervious dam provided very close moisture and density control is maintained during construction. A modified-homogeneous cross-section is proposed, with a toe filter to provide positive protection against downstream toe piping.

It is recommended that the earth dam be constructed directly on the valley fill surface without a cutoff trench. If desired, a minimum key trench, not over two feet deep, could be used. The ditch bottom should be carefully cleaned and backfilled with clayey silt in horizontal layers to the same standard as used for the remaining of the embankment. Compacted fill should be used to fill the ditch to a distance of at least 200 feet upstream to prevent underseepage through its channel.

There is no restriction on the crest width of the dam. However, it is expected that a minimum crest of ten feet should be provided to accommodate the construction equipment placing the embankment. Since the foundation soils are firm to stiff, and will consolidate almost as rapidly as the embankment is placed, no camber of the crest will be needed provide for future settlement:

Side slopes of three horizontal to one vertical (3:1) are recommended for upstream and downstream elements of the dam. Although the embankment soils, if compacted as recommended below, should be capable of standing on steeper slopes, a flatter slope is recommended to permit grass mowing equipment to negotiate the downstream slope, to aid in erosion prevention on the upstream face, and to make allowance for earthquake stresses.

Upstream wave protection can be either rip-rap or a protective wooden fence-type device. If stone is used as protection, then the rip-rap should be placed at least two feet thick for a distance at least five feet above and below the extremes of water level expected within the normal pool operation. Probably a more economical method of wave protection is the use of a fence. However, this may require replacement at a future date. Soldier piles should be driven several feet into the embankment at an elevation of about three or more feet below expected low water. They should extend several feet above high water. Treated wood planks should be placed behind the soldier piles and the area behind the planks filled with compacted fill sand or clay. For greater permanence, this maybe replaced with a more expensive concrete wall designed somewhat as a cantilever retaining wall.

A toe filter should be placed as shown on the attached drawing, Figure 2. Considering economics and availability of materials, it is recommended that a medium sand be used and a filter cloth be placed around the drain pipe rather than use a graded filter. Any sand gradation may be used provided it is free draining and contains no more than 1% passing the No. 100 screen. The toe drain should extend the full length of the dam, from water line to water line. The drain should have a width at least equal to that shown since its main function is to intercept underseepage and prevent erosion of the toe of the dam. Some seepage, of a lesser amount, is expected through the embankment of the dam itself. Compaction of the sand in place should be in accordance with the semi-compaction procedures as outlined in project specifications. The outer surface of the filter drain should be protected by a minimum by one foot of compacted earth fill to prevent erosion of the sand.

### Compacted Fill Requirement

The fill soils for the embankment, exclusive of the toe drain, will undoubtedly be composed of local clayey silt from the emergency spillway excavation. General project specification requirements regarding top soil, root matter, etc, should be observed in the selection of embankment soils from the borrow pit.

Because of the extreme sensitivity of this soil to moisture content variation during compaction, it may be necessary to provide for areas where drying or wetting, as needed, can be performed. The moisture content should be at or slightly above the laboratory-derived moisture content of the Proctor compaction test. The entire embankment, exclusive of the toe-drain, should be placed in nine-inch loose, horizontal layers, and rolled uniformly until a minimum of 95% Standard Proctor density is achieved. It is expected that a mechanical tamping roller, such as a sheepfoot, must be used to achieve uniform densification throughout the lift thickness.

The use of hauling equipment such as scrapers or crawler tractors as compaction equipment is not considered satisfactory. This type of equipment should be permitted only after extensive field tests prove the capability of the equipment and of the contractor to provide uniform coverage and uniform densification.

The integrity of the compacted fill can only be assured if there is adequate inspection and testing. A qualified soils engineering technician should be present at all times during placement of compacted fill to observe uniform compaction, lift thickness, quantity and type of soil being placed, and other necessary observations. The frequency of field density tests should be as given in the project specification. The soils engineering technician should have the capability of performing Proctor compaction tests quickly, either in the field or in the laboratory, so that changes in material type can be quickly evaluated for quality control purposes to prevent delay of the contractor.

This writer has reviewed the project specifications developed by Continental Engineering, Inc., and concurs with all of their provisions. For this reason, various recommendations regarding compacted fill are not presented here since they are adequately covered in the specifications.

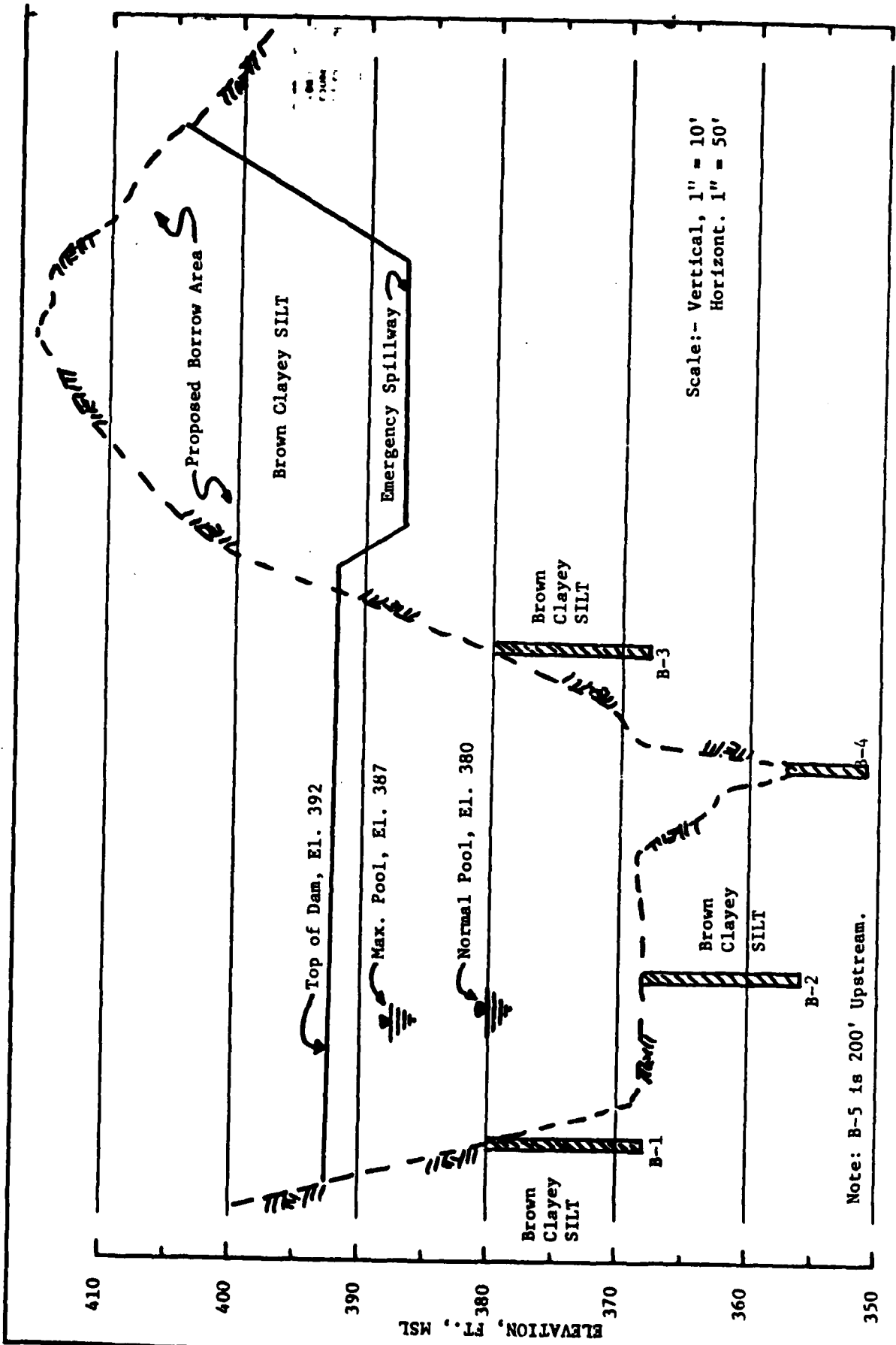


Figure 1, SOIL PROFILE

Legend: (Water Content) 23, (Tube Sample) 3.2 (Uncorr. Comp. Sr., Krf) 16 (Std. Penetr. Test N-Value) 3.2 (Uncorr. Comp. Sr., Krf)

Note: Stream boundaries shown between boring locations are for illustrative purposes only. No guarantee is made or implied regarding actual stream boundaries.

Scale: 1" = 20'

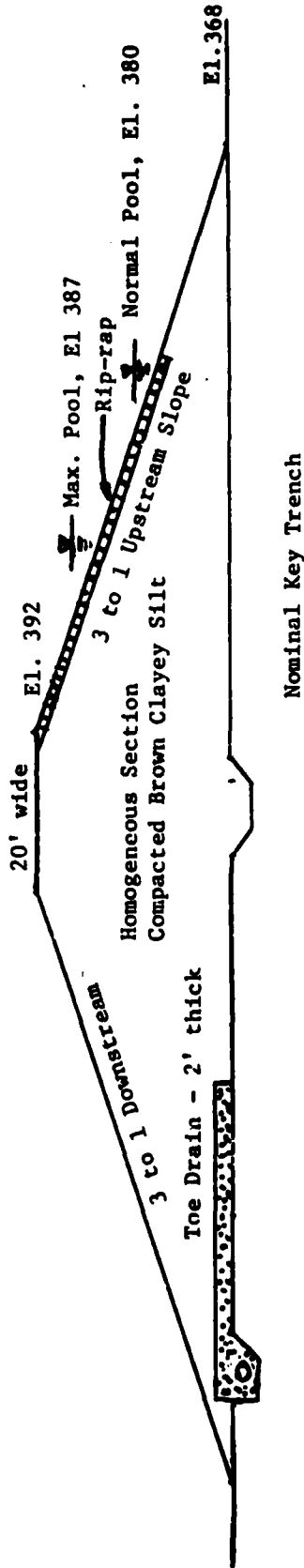


Figure 2. EMBANKMENT CROSS-SECTION.

Dam Site 41-1, Gladly Hollow  
Obion County, Tennessee

## LOG OF BORING

<b>PROJECT</b> Dam Site 41-1, Gladly Hollow Obion County, Tennessee				<b>JOB NO.</b> G-260	<b>BORING NO.</b> <u>1</u> <b>SHEET</b> <u>1</u> <b>OF</b> <u>1</u>	
<b>GROUND SURFACE ELEVATION</b> <u>380</u> <b>DATUM</b> <u>MSL</u>			<b>BORING LOCATION:</b> West Abutment-Normal Pool Level- Centerline			
<b>BORING TYPE:</b> 6" Hand Auger		<b>GROUND WATER LEVEL</b> None <u>AT</u> <u>Drilling</u> _____ <u>AT</u> _____ _____ <u>AT</u> _____ _____ <u>AT</u> _____		<b>DATE</b> <u>August, 1976</u> <b>WEATHER</b> <u>Clear</u> <b>DRILLER</b> <u>Continental</u> <b>INSPECTOR</b> <u>Spigolon</u> <b>BORING TERMINATED AT</b> <u>12'</u>		
Stratum Depth, Ft.	Sample Depth Ft. From-To	Sample No.	Standard Penetration Test—N Blows/Ft.	SAMPLE DESCRIPTION AND REMARKS	Water Content %	Hand Penetro- meter TSF
	2'	1		Brown SILT		
	4'	2		Brown SILT		
	6'	3		Brown SILT		
	8'	4		Brown SILT, Tr. Organics		
	10'	5		Brown Clayey SILT		
	12'	6		Brown Clayey SILT		

SPIGOLON ENGINEERING LABORATORIES, INC.

## LOG OF BORING

<b>PROJECT</b> Dam Site 41-1. Gladly Hollow Obion County, Tennessee	<b>JOB NO.</b> G-260	<b>BORING NO.</b> <u>2</u> <b>SHEET</b> <u>1</u> OF <u>1</u>
---	-------------------------	---

<b>GROUND SURFACE ELEVATION</b> <u>369</u> <b>DATUM</b> <u>MSL</u>	<b>BORING LOCATION:</b> Center of Valley Bottom, Centerline of Dam
---	---

<b>BORING TYPE:</b> 6" Hand Auger	<b>GROUND WATER LEVEL</b> None AT <u>Drilling</u> AT _____ AT _____ AT _____	<b>DATE</b> <u>August, 1976</u> <b>WEATHER</b> <u>Clear</u> <b>DRILLER</b> <u>Continental</u> <b>INSPECTOR</b> <u>Spigolon</u> <b>BORING TERMINATED AT</b> <u>12'</u>
--------------------------------------	--	---

Stratum Depth, Ft.	Sample Depth Ft. From-To	Sample No.	Standard Penetration Test—N Blows/Ft.	SAMPLE DESCRIPTION AND REMARKS	Water Content %	Hand Penetrometer TSF
	2'	1		Brown Clayey SILT		
	4'	2		Brown Clayey SILT		
	6'	3		Brown Clayey SILT		
	8'	4		Brown Clayey SILT		
	10'	5		Brown Clayey SILT		
	12'	6		Brown SILT & CLAY, Laminated.		

### LOG OF BORING

<b>PROJECT</b> Dam Site 41-1, Gladly Hollow Obion County, Tennessee		<b>JOB NO.</b> G-260	<b>BORING NO.</b> 3 <b>SHEET</b> 1 OF 1			
<b>GROUND SURFACE ELEVATION</b> 380 <b>DATUM</b> MSL		<b>BORING LOCATION:</b> East Abutment-Normal Pool Level-Centerline				
<b>BORING TYPE:</b> 6" Hand Auger		<b>GROUND WATER LEVEL</b> NONE AT <u>Drilling</u> AT _____ AT _____ AT _____				
		<b>DATE</b> August, 1976 <b>WEATHER</b> Clear <b>DRILLER</b> Continental <b>INSPECTOR</b> Spigolon <b>BORING TERMINATED AT</b> 12'				
Stratum Depth, Ft.	Sample Depth Ft. From-To	Sample No.	Standard Penetration Test—N Blows/Ft.	SAMPLE DESCRIPTION AND REMARKS	Water Content %	Hand Penetrometer TSF
	2'	1		Mottled Brown Clayey SILT		
	4'	2		Brown Clayey SILT		
	6'	3		Brown Clayey SILT		
	8'	4		Mottled Brown Clayey SILT		
	10'	5		Mottled Brown CLayey SILT		
	12'	6		Grey Clayey SILT		

## LOG OF BORING

<b>PROJECT</b> Dam Site 41-1, Gladly Hollow Obiba County, Tennessee	<b>JOB NO.</b> G-260	<b>BORING NO.</b> <u>5</u> <b>SHEET</b> <u>1</u> OF <u>1</u>
---	-------------------------	---

<b>GROUND SURFACE ELEVATION</b> <u>370</u> <b>DATUM</b> <u>MSL</u>	<b>BORING LOCATION:</b> 200 Ft. Upstream- Center of Valley Bottom
---	--

<b>BORING TYPE:</b> 6" Hand Auger	<b>GROUND WATER LEVEL</b> None AT <u>Drilling</u> AT _____ AT _____ AT _____	DATE <u>August, 1976</u> WEATHER <u>Clear</u> DRILLER <u>Continental</u> INSPECTOR <u>Spigolon</u> BORING TERMINATED AT <u>12'</u>
--------------------------------------	--	--

Stratum Depth, Ft.	Sample Depth Ft. From-To	Sample No.	Standard Penetration Test—N Blows/Ft.	SAMPLE DESCRIPTION AND REMARKS	Water Content %	Hand Penetrometer TSP
	2'	1		Brown Clayey SILT		
	4'	2		Brown Clayey SILT		
	6'	3		Brown Clayey SILT		
	8'	4		Brown SILT, Trace Clay		
	10'	5		Brown SILT		
	12'	6		Brown SILT		

## LOG OF BORING

<b>PROJECT</b> Dam Site 41-1, Gladly Hollow Obion County, Tennessee		<b>JOB NO.</b> G-260	<b>BORING NO.</b> 4 <b>SHEET</b> 1 <b>OF</b> 1
<b>GROUND SURFACE ELEVATION</b> 358 <b>DATUM</b> MSL		<b>BORING LOCATION:</b> Bottom of Ditch, Centerline of Dam	
<b>BORING TYPE:</b> 6" Hand Auger		<b>GROUND WATER LEVEL</b> Nonat <u>Drilling</u> AT _____ AT _____ AT _____	
		DATE <u>August, 1976</u> WEATHER <u>Clear</u> DRILLER <u>Continental</u> INSPECTOR <u>Spigolon</u> BORING TERMINATED AT <u>6'</u>	

Stratum Depth, Ft.	Sample Depth Ft. From-To	Sample No.	Standard Penetration Test—N Blows/Ft.	SAMPLE DESCRIPTION AND REMARKS	Water Content %	Hand Penetrometer TSP
	2'	1		Brown Clayey SILT, Trace Fine Sand		
	4'	2		Brown Clayey SILT, Trace Fine Sand		
	6'	3		Brown Silty CLAY, Trace Fine Sand		

**SPIGOLON ENGINEERING LABORATORIES, INC.**

**CONTINENTAL  
ENGINEERING, INC.**

Suite 801 Directors Plaza/3036 Directors Row/ Memphis, Tn. 38131/Ph (901) 332-4055

November 8, 1976

Mr. Ed O'Neill  
Regional Engineer  
Route 2, Box 156 B  
Medon, Tennessee 38356


Re: Dam Site #41-1

Dear Mr. O'Neill:

Enclosed is a final soils report on the above referenced site.

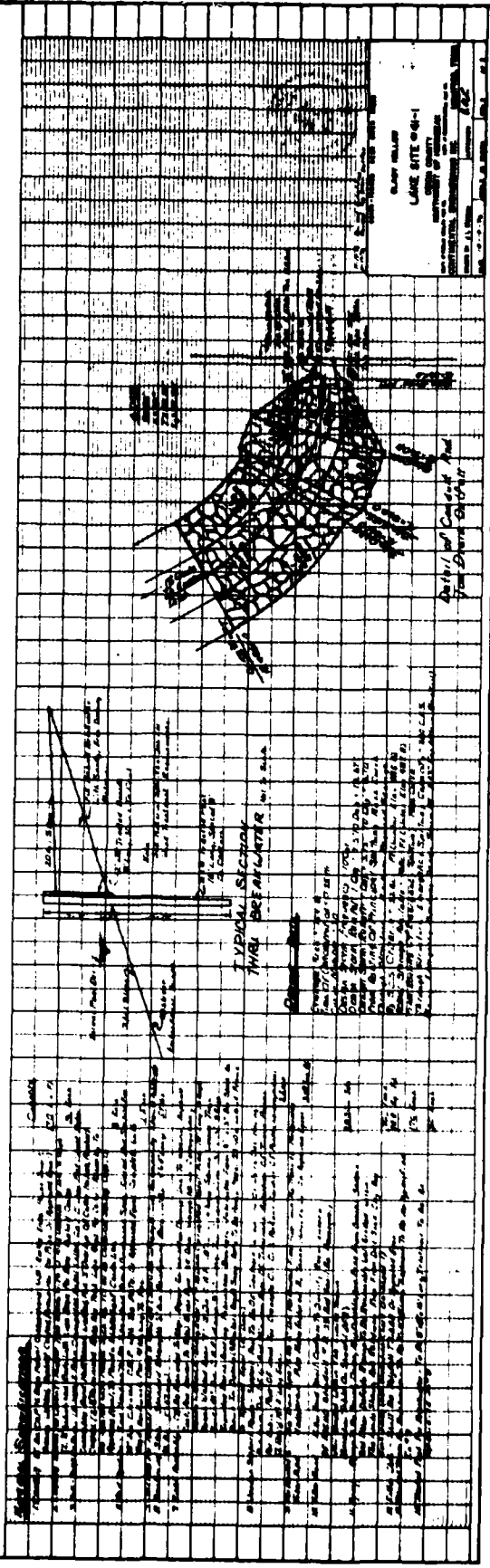
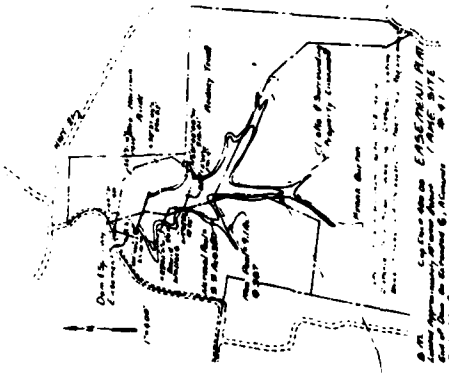
If there are any questions, please call.

Sincerely,

  
David Rauchle

GDR/bc

Enc.



DRAWN BY: [Name]  
 CHECKED BY: [Name]  
 DATE: [Date]  
 PROJECT: [Project Name]  
 SHEET NO. [Number] OF [Total]

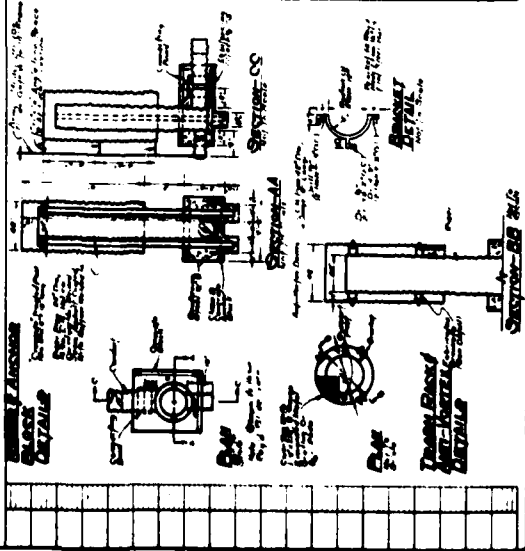
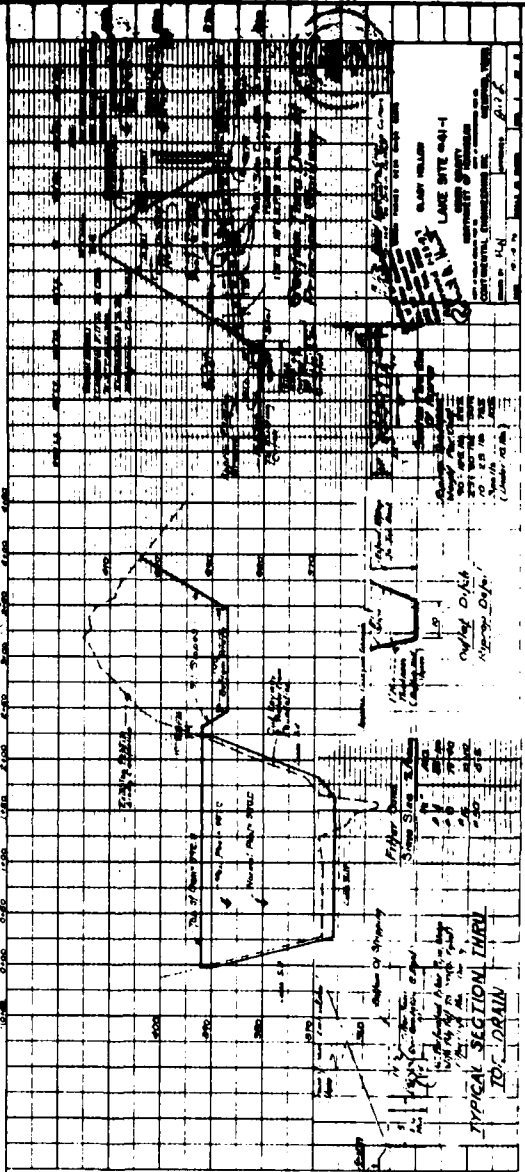
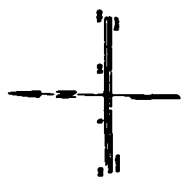
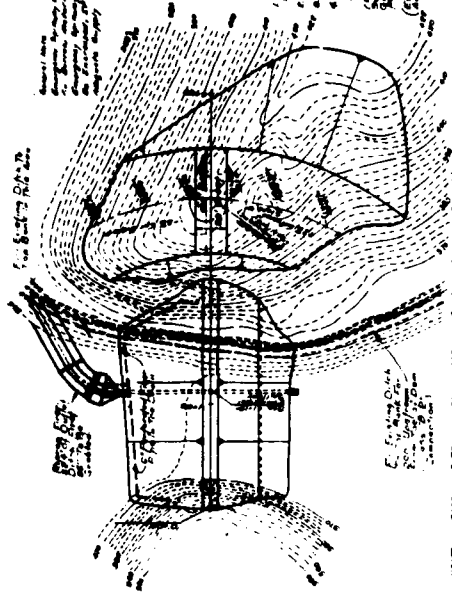
THIS DRAWING IS BEST QUALITY PLOT OF ORIGINAL  
 FROM COUNTY FURNISHED TO DDG





**VERTICAL CURVE**

- 1. Check the proposed vertical curve for proper drainage.
- 2. Check the proposed vertical curve for proper drainage.
- 3. Check the proposed vertical curve for proper drainage.
- 4. Check the proposed vertical curve for proper drainage.
- 5. Check the proposed vertical curve for proper drainage.
- 6. Check the proposed vertical curve for proper drainage.
- 7. Check the proposed vertical curve for proper drainage.
- 8. Check the proposed vertical curve for proper drainage.
- 9. Check the proposed vertical curve for proper drainage.
- 10. Check the proposed vertical curve for proper drainage.



THIS IS BEST QUALITY PRAC...  
 ...GRANISHED TO UDC



NSR

APPENDIX F  
HYDRAULIC AND HYDROLOGIC ANALYSES

## Hydraulic and Hydrologic Calculations

The Gladly Hollow Dam is a small size, high hazard potential dam. According to OCE guidelines it is required to pass a minimum one-half Probable Maximum Flood ( $\frac{1}{2}$ PMF) without overtopping. Six-hour rainfall depths for the Probable Maximum Precipitation (PMP) and the 100-year rainfall were obtained from the U. S. Weather Service TP-40.

The six-hour PMP was estimated to be 28.7 inches producing a PMF of 24.1 inches (CN 70, AMC II). Total inflow into the reservoir is 310 acre-feet with a peak inflow of 3191 cfs. The emergency spillway is capable of passing the resulting runoff with 1 foot of freeboard remaining. Additional routings indicate that the spillway is able to pass the  $\frac{1}{2}$ PMF with 2.6 feet of freeboard remaining.

The six-hour 100-year rainfall was estimated to be 5.2 inches producing a runoff of 3.55 inches (CN 85, AMC III). Total inflow into the reservoir is 46 acre-feet with a peak inflow of 351 cfs. The flood failed to produce flow through the emergency spillway.

Runoff hydrographs for the drainage basin were computed using the dimensionless unit hydrographs presented in Section 4, Chapter 21 of the Soil Conservation Service National Engineering Handbook. Routings through the reservoir were done using the equation:

$$I_1 + I_2 + \left(\frac{2S_1}{\Delta t} - O_1\right) = \left(\frac{2S_2}{\Delta t} + O_2\right)$$

Drainage Area characteristics including the runoff curve number and estimated time of concentration were obtained from the original design plans.

SUMMARY OF ROUTINGS

EVENT	ANTECEDENT MOISTURE CONDITION	
	II	III
PMF	Passed, 1.0 feet freeboard	Passed, 0.4 feet freeboard
$\frac{1}{2}$ PMF	Passed, 2.6 feet freeboard	Passed, 2.2 feet freeboard
100-YEAR	Passed, 8.5 feet freeboard	Passed, 6.5 feet freeboard

## GLADY HOLLOW DAM

### Basin Characteristics

- A. Watershed Size - 15.4 acres
- B. Average Land Slope - 12%
- C. Hydrologic Soil Groups - Memphis-B
- D. Time of Concentration - 0.25 hours
- E. SCS Curve Number - 70 (AMC II)

### Reservoir Characteristics

- A. Normal Pool Elevation - 380 feet
- B. Dam Crest Elevation - 392 feet
- C. Normal Pool Area - 5.5 acres
- D. Normal Pool Length - 1400 feet
- E. Normal Storage - 35 acre-feet
- F. Flood Pool Storage - 85 acre-feet
- G. Maximum Storage - 135 acre-feet

### Principal Spillway

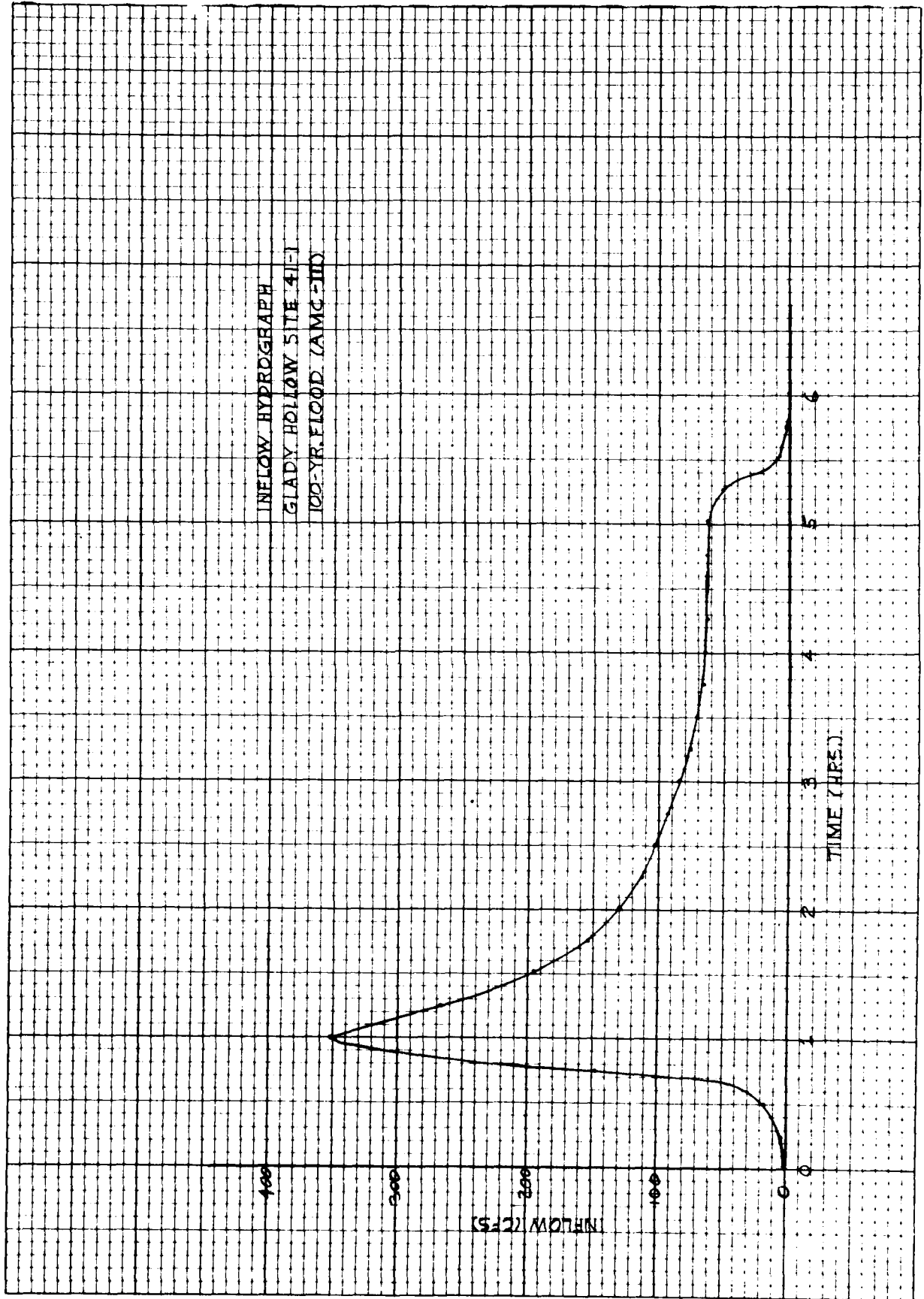
- A. Type - 24 inch diameter CMP riser
- B. Crest Elevation - 380 feet
- C. Maximum Discharge Capacity

### Emergency Spillway

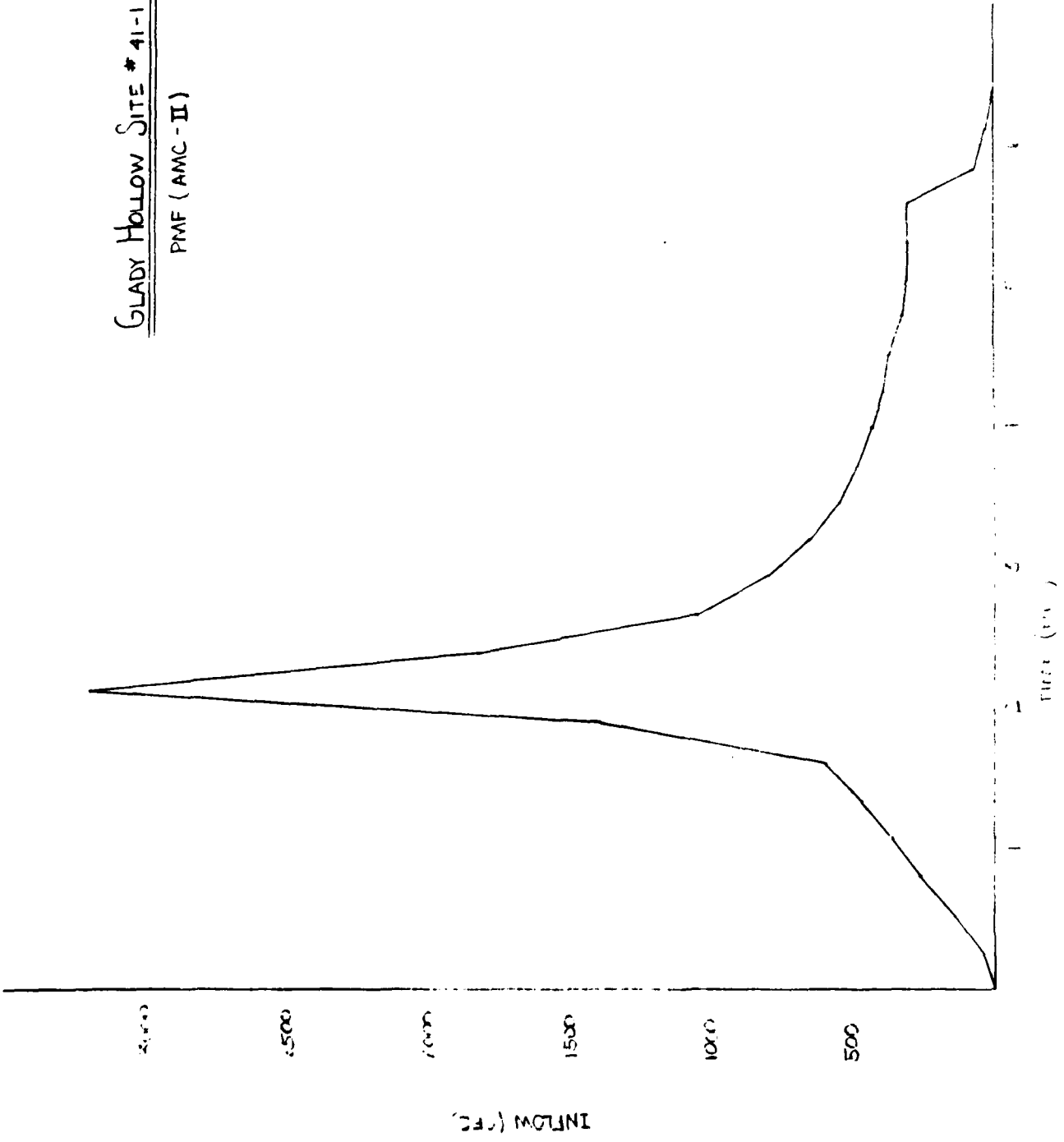
- A. Type - Saddle, vegetated earth
- B. Crest Elevation - 387.2 feet
- C. Maximum Discharge Capacity - 2975 cfs

DIETZEN CORPORATION  
MADE IN U.S.A.

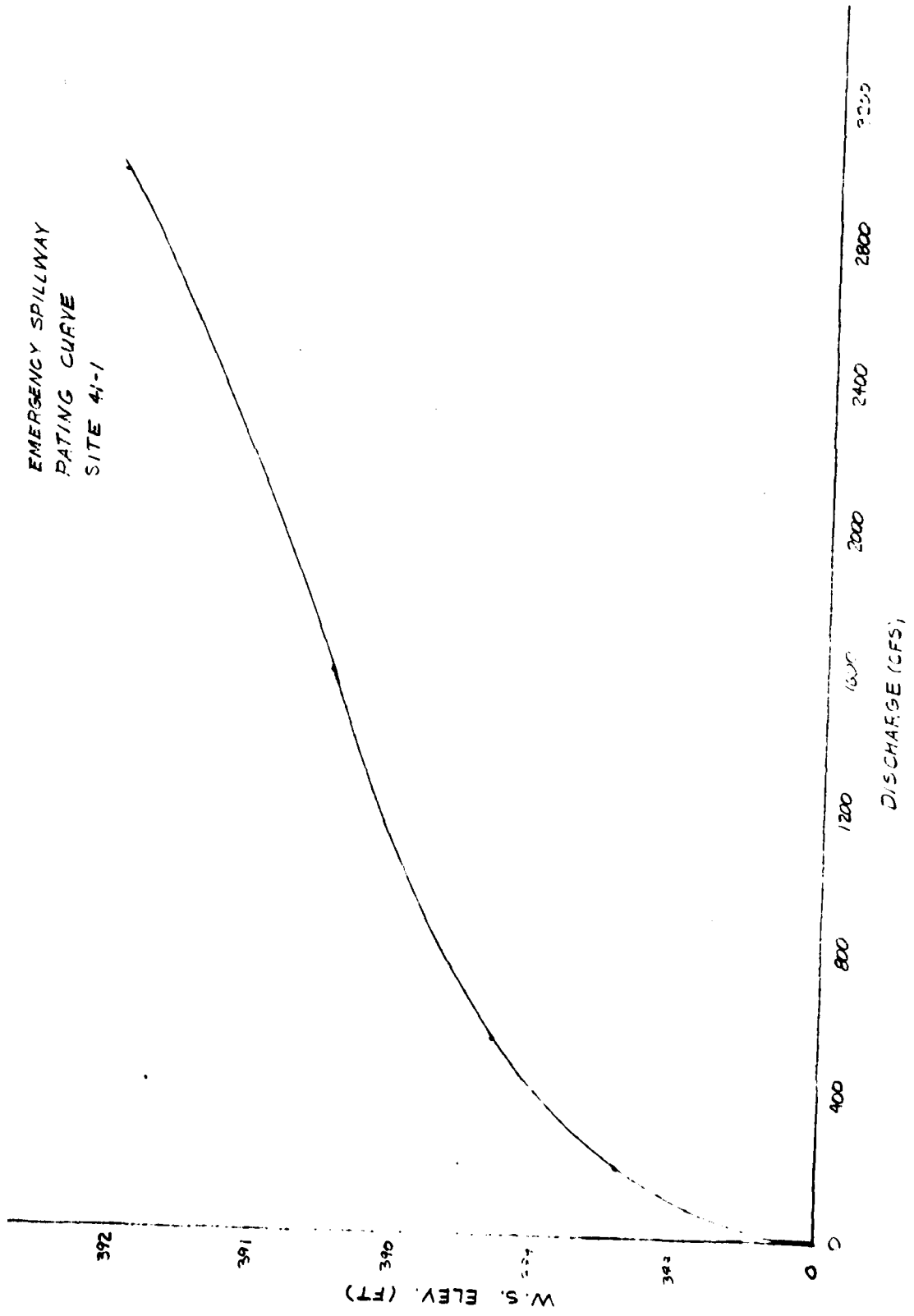
NO. 340R-10 DIETZEN GRAPH PAPER  
10 X 10 PER INCH



GLADY HOLLOW SITE # 41-1  
PMF (AMC-II)



EMERGENCY SPILLWAY  
RATING CURVE  
SITE 41-1



Principal Spillway Rating

W. S. Elev. (ft.)	Weir Flow (cfs)	Pipe Flow (cfs)
380	0	
380.5	7	
381	19.5	
381.5		24.5
382		25.9
383		26.6
385		27.9
387		29.1
388		29.8
389		30.3
390		30.9
391		31.5
392		32.1

Glady Hollow Dam

Elev. (ft)	Storage (ac-ft)	Storage (sfd)	$\frac{S}{\Delta t}$ (cfs)	O (cfs)	$\frac{2S}{\Delta t} + O$ (cfs)
380	0	0	0	0	0
382	12	6.0	723	26	1472
384	25	12.6	1518	27	3063
386	41	20.7	2474	28	5016
387	47.5	25.0	3012	29	6053
388	57	29.7	3572	130	7226
389	60	34.3	4132	430	8694
390	72	47.5	4735	1020	10555
391	80.5	44.6	5373	2142	12357
392	100	50.4	6072	3010	15162

$\Delta t = 0.2 \text{ hr} = 0.0023 \text{ day}$

BEST QUALITY PRACTICES  
 ADVISED TO DDC

GLADY HOLLOW  
SITE 41-1

DISCHARGE (CFS)

1000

2000

3000

4000

5000

6000

7000

8000

9000

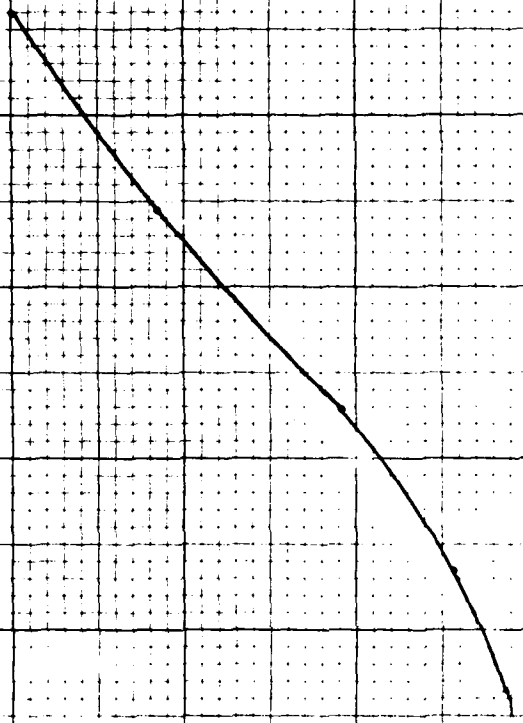
10000

11000

12000

13000

25/11/13  
7:41 + 10 (CFS)





GLADY HOLLOW  
ROUTING TABLE  
100-YR (AMC-III)

TIME HRS	INFLOW (cfs)	$\frac{2s}{\Delta t} - O$ (cfs)	$\frac{2s}{\Delta t} + O$ (cfs)	O (cfs)
0	0	0	0	0
0.2	4	4	4	0
0.4	11	19	12	0
0.6	32	62	32	0
0.8	230	319	239	5
1.0	351	351	351	21
1.2	285	1435	1435	100
1.4	200	1890	1890	200
1.6	80	2201	2280	300
1.8	150	2212	2212	300
2.0	200	2360	2360	300
2.2	117	2035	2035	300
2.4	108	2004	2004	300
2.6	79	1857	1857	300
2.8	91	1800	1800	300
3.0	85	1700	1700	300
3.2	78	1600	1600	300
3.4	70	1500	1500	300
3.6	70	1400	1400	300
3.8	67	1300	1300	300
4.0	65	1200	1200	300
4.2	60	1100	1100	300
4.4	55	1000	1000	300
4.6	50	900	900	300
4.8	45	800	800	300
5.0	40	700	700	300
5.2	35	600	600	300
5.4	30	500	500	300
5.6	25	400	400	300
5.8	20	300	300	300
6.0	15	200	200	300
6.2	10	100	100	300
6.4	5	50	50	300
6.6	0	0	0	300
6.8	0	0	0	300
7.0	0	0	0	300

THIS IS BEST QUALITY PRACTICABLE  
FURNISHED TO DDC





**APPENDIX G**  
**CORRESPONDENCE**



TENNESSEE DEPARTMENT OF CONSERVATION  
DIVISION OF WATER RESOURCES  
4721 TROUSDALE DRIVE, NASHVILLE 37220  
615/741-6900

Certified

December 1, 1980

Obion-Forked Deer Basin Authority  
Box 34, State Office Building  
225 Madison Avenue  
Jackson, TN 38301

Dear Dam Owner:

As provided by the State Safe Dams Act, Tennessee Code Annotated, Sections 70-2501 to 70-2530, non-federal dams in Tennessee must be inspected and certified for safety by our agency. According to our records, you are identified as the owner of Glady Hollow Site Dam, located in Obion County, Tennessee. 41-1  
Enclosed for your information and review is a copy of our inventory record on the structure along with a copy of the Act and adopted rules and regulations.

Tentative plans are to schedule a safety inspection of your dam within the next few months. A staff engineer will very shortly be in further communication with you to discuss the pending inspection and your responsibilities under the Safe Dams Act. Your immediate attention, however, is called to the matter of maintaining the earthen dam with a good grass cover and clear of all brush, undergrowth and tree growth. If these conditions do not presently exist, please make plans to remove the brush, undergrowth and all trees less than two inches in diameter as soon as possible. Larger trees may have to be removed at a later date but must be done so under the direction of an experienced engineer.

Please let me, or our Chief Engineer, Mr. Ed O'Neill, know of any assistance we might be.

Very truly yours,

Robert A. Hunt, P.E.  
Director, Division of Water Resources

RAH:lt

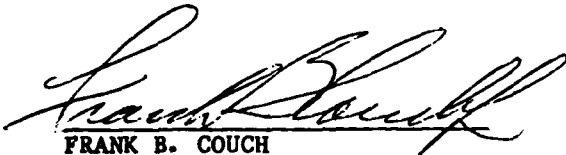
Enclosures

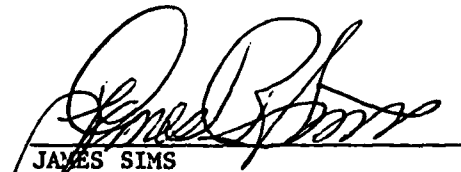
NON-FEDERAL DAM INSPECTION REVIEW BOARD  
PO BOX 1070  
NASHVILLE, TENNESSEE 37202


ORNED-G


Commander  
US Army Engineer District, Nashville  
PO Box 1070  
Nashville, TN 37202

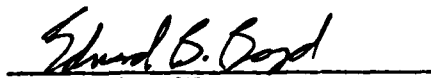
1. The Interagency Review Board, appointed by the District Engineer on 8 October 1980, presents the following recommendations after meeting on 21 May 1981 to consider the Phase I investigation report on OFDBA Site 41-1 (Glady Hollow Dam) inspected by the Tennessee Department of Conservation.
2. The board is in agreement with report conclusions and recommendations following minor revisions.

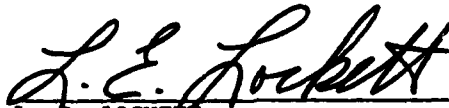
  
FRANK B. COUCH  
Chief, Geotechnical Branch  
Chairman

  
JAMES SIMS  
Design Engineer  
Alternate, Soil Conservation Service

  
ROBERT A. HUNT  
Director, Div of Water Resources  
State of Tennessee

  
H. F. PHILLIPS  
Chief, Hydraulics Section  
Alternate, Hydrology & Hydraulics Branch

  
EDWARD B. BOYD  
Hydrologic Technician  
Alternate, US Geological Survey

  
L. E. LOCKETT  
Structural Engineer  
Alternate, Design Branch

END

DATE  
FILMED

1-82

DTIC